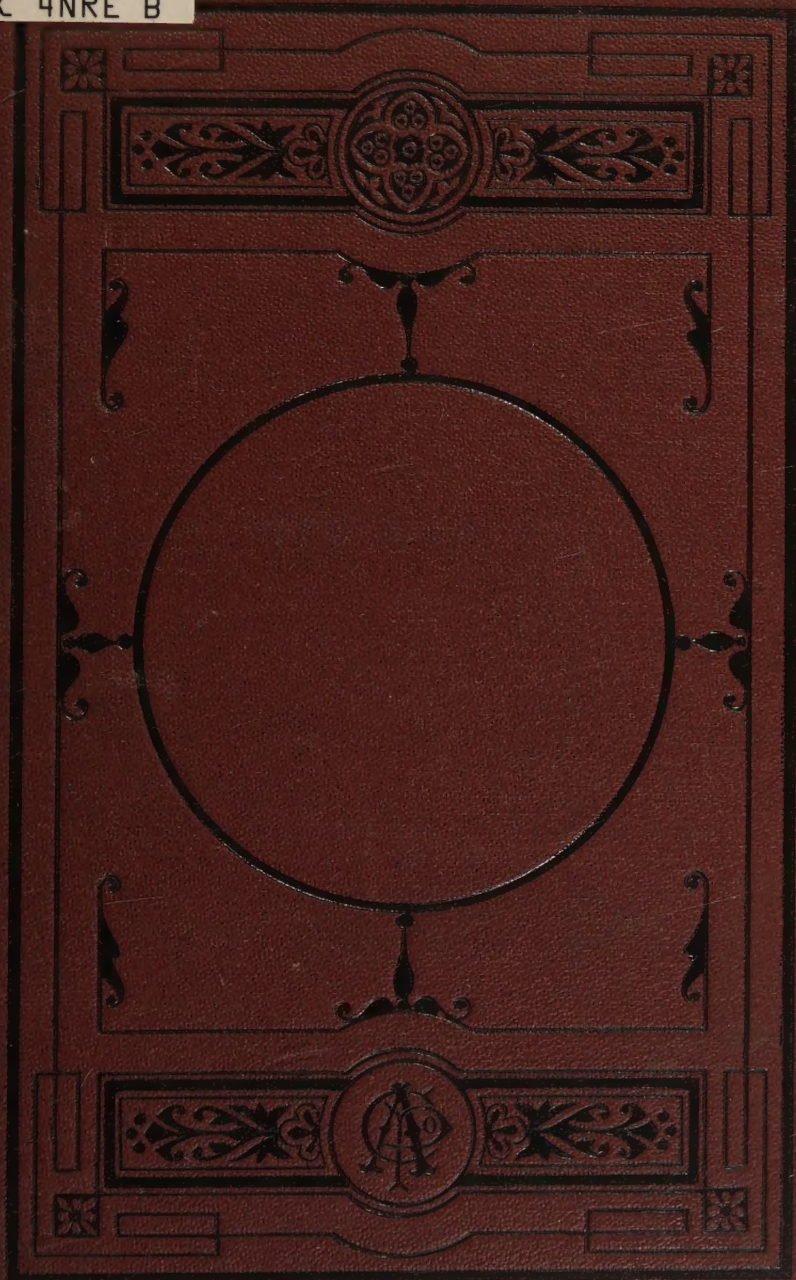


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EVOLUTION AND PROGRESS.

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30 BOND STREET, NEW YORK,
September 15, 1874.

EVOLUTION AND PROGRESS:

AN

EXPOSITION AND DEFENCE.

• THE FOUNDATION
OF EVOLUTION PHILOSOPHICALLY EXPOUNDED,
AND ITS ARGUMENTS

(DIVESTED OF INSIGNIFICANT AND DISTRACTING PHYSICAL DETAILS)

SUCCINCTLY STATED:

TOGETHER WITH A REVIEW OF

LEADING OPPONENTS, AS DAWSON AND WINCHELL, AND
QUASI OPPONENTS, AS LE CONTE AND CARPENTER.

BY

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REV. WM. I. GILL, A.M.



NEW YORK:
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TO

HERBERT SPENCER, ESQUIRE,

AND THE GREAT BROTHERHOOD OF EVANGELICAL DIVINES,

THE AUTHOR DEDICATES

EVOLUTION AND PROGRESS:

IN TOKEN THAT THE FULL COMPLEMENT OF TRUTH MUST
ENSPHERE ALL THE ANTIPODES OF THOUGHT.

P R E F A C E.

“THE limitation of the human faculties” is strikingly manifest in our inability to understand those with whom we differ; and this inability is especially conspicuous if we are indisposed to change or to be disturbed in our views. Hence the almost constant mutual misconception and unconscious or semi-conscious mutual misrepresentation of opposing parties and dogmas. Hence also futile and irrelevant arguments. A man who comprehends his own position and argument and also those of his opponent will never, if honest, present an irrelevant or otherwise futile argument. It is possible that he may comprehend neither, and yet be very earnest in the debate, or rather strife; and in such cases both the process and result of the contest are deplorable. A good many recent refutations of Evolution are of this character; and the dispassionate friend of truth who does understand the case on both sides is painfully impressed by such exhibitions of mock intellectual knighthood; which he compares to Don Quixote’s assault and complete overthrow of the mighty army which turned out to be only a flock of sheep. These facts are responsible for this small book—a defence of absolute evolution from the centre of the most fervent and active form of evangelical orthodoxy.

Let the truth be known and admitted so far as we go. If evolution is not true, let its foes make sure they understand it before they attempt its refutation, and let them find arguments which disprove evolution itself instead of disproving something else under the same name, or which prove nothing at all except the incapacity of those who use them.

This incapacity creates a deeper difficulty. It constitutes an obstacle in the way of any one who has something new and true to offer, which will be neither comprehended nor fairly examined nor allowed free perambulation unless it favors the dogmatist's misconception of his opponents, or unless, as John S. Mill said, it attaches new truths to obsolete premises, thus imposing on the public by seeming to hold what it discards. For himself, the writer cares very little for evolution as an ultimate system of philosophy. We think its method, so far as it goes, is philosophical, its arguments sound and logical, and its conclusions invulnerable against anything that has yet been brought to bear against them. But we want, however, to go farther, and get something broader and more profound, something that leaves intact what evolution has disclosed, but finds it a place in a larger scheme, and ennobles it by the new and higher relations into which it is thus brought. But incomprehensive and uncomprehending dogmatism, whether for or against evolution, for it belongs to both sides, stands in the way, and demands that progress shall be in a circle. But it is orthodox dogmatism which on this subject is most obstructive

of progress; and it therefore requires to be startled if not stung into the perception of its philosophically defenceless and helpless condition, so as to make it see a new light and accept the offer of more effective weapons. Kant confessed that the skepticism of Hume broke the dogmatic slumbers which he was indulging on the iron bed of the Leibnitzo-Wolfian philosophy, and thus quickened the world afresh into thought. Evolution is surely destined to perform the same office more healthfully for the complacent slumberers of this age, whether physical, metaphysical, or theological slumberers. To make a small contribution toward this result is the object of this monograph.

There are many who are crying, Peace, peace, where there is no peace, and they are healing their theological hurt slightly, daubing with untempered mortar. They bless their superannuated philosophy with the wild belief that evolution is becoming exhausted, going off into a decline, and that it will soon die of inanition. On the contrary, it is like the mountain stream, making fresh acquisitions, and increasing in strength and volume as it rolls, and must continue so to do till it is lost in the ocean. Evolution is now made the foundation of religious rationalism in England and America, and the best foundation it has ever had, one which can easily be exhibited to the common people; and the "liberal" pulpit is becoming fervent and attractive in its efforts to show how the Gospel can be and should be accommodated to Spencerianism, and how this system furnishes the best philosophy of religion. Prac-

tically, therefore, it is not to be ignored and poohpoohed or treated with indifference by the evangelicals, as some of them affect to do. Never was thought so active as it is to-day, and never was there so large a number of great and cultured and eminently virtuous and dispassionate minds who doubt or disbelieve the existence of a personal Deity. Whither are these facts pointing?

It will be well, before we proceed, to consider our terminology a little. A neology of terms naturally engenders the supposition of a neology of ideas and methods, and on this account the term evolution may possibly be to some readers a little misleading, without some explanation. Though this term is new, the essential idea that it expresses is ancient. Ever since the dawn of philosophy, it has seemed to many philosophers, and to nearly all the ancients, who were unwarped by priestly dogmas obtruded upon philosophy, that nature is a force, and that she generates her own phenomena, and this constitutes her own explanation of phenomena; and this is the essential idea of evolution, whether nature's force and ever-evolving phenomena are ascribed to an *anima mundi*, with Plato, or to the inherent nature and mutual relations of the atoms of matter, with Lucretius. Evolution in modern times is distinguished from the ancient cosmical theories chiefly by its scientific statement and proofs of what was once only conjectured, though the conjectures were ingenious and made in view of facts laborously collected and patiently pondered.

Mathew Arnold's book on Literature and Dogma, in which he propounds his view of God and religion, is in substantial accord with the foregoing. His "stream of tendency by which everything fulfils the law of its being," is but a novel and less elegant and scientific form of expression for natural forces and laws; and as he pronounces his stream of tendency to be God, he identifies God with natural force and all natural laws. In this conception of Deity the orthodox often concur. It is one of their standard positions that the forces of nature, the *real* and *efficient* forces of nature are God, that nature's laws are methods of His working, that the thunder-peal is one of his seven voices, and the lightning a flash of His eye. They hold that God is more than this, more than is seen or discoverable in all the forms and forces of nature, inner or outer; and this is not disputed by evolution, though it questions and challenges all proofs of His supernatural action.

Evolution, again, while it is new in modern times as a term which designates a system of philosophy, yet it does not designate any novel process by which that system has been attained. Evolution as a system has been attained by the legitimate use of the method which began with inductive science. Inductive science, like the practical judgment of mankind in the practical affairs of life, has recognized material forces in material things; and like the practical judgment it has always determined causes and consequences by sequences; and evolution is only the scientific (as well the popular and practical) law of

natural causation carried out to higher results than ever before. Evolution does not denote merely a completed result of natural causation, but also a *process* of natural causation; and natural causation is always a process of evolution, whether coextensive with the universe or with only a part of it; and the processes include results, for results are always processes. Hence, the different extensions and limitations of meaning in which the term evolution is used. Agassiz admitted evolution to one extent, Darwin advocates evolution to a larger extent, Spencer to a larger extent than Darwin, and Büchner to a larger extent than Spencer. No philosopher or scientist utterly rejects all degrees of evolution; and the only question debatable is, how far we shall carry it, and where shall we stop?

In all degrees of extension or limitation of meaning, evolution is a term which expresses the operation of natural force and law; and in this general sense all parties use it with specific differences under this generic meaning. We have used it as commensurate with Spencerianism, though we shall also use it, as the context will intimate, in a more restricted sense.

From this exposition of the subject and its chief technical term we see that evolution is simply naturalism, whether partial or universal, that it is the familiar and reasonable method of explaining phenomena by natural causes so far as possible, and of determining natural causes by observation of phenomenal connections. Evolution is thus synonymous with natural causation, which, like evolution, may

be limited or unlimited. Evolution is therefore the contrary correlative of supernaturalism, each of which excludes the other, and the absence of either implies the presence of the other, so that the sublation of the supernatural posits the natural or evolution; and philosophy and science unite in maintaining that evolution is to be preferred whenever it is not absolutely necessary to infer a supernatural agent.

This book was at first designed only as a brief essay, as a private discussion with a friend, and it originated as follows:—Conversing with Prof. B., of — Theological Seminary, I asserted that the orthodox do not understand their opponents, that in the present state of philosophy evolution can be rigidly maintained and triumphantly vindicated against all the assaults of Theism, and that the latter will have to adopt an entirely new method of defence and attack; and as the Professor disputed this, I promised to prove it in a short article, which now turns out to be a book. The object therefore of this volume is complex—first to show to the orthodox that they stand on slippery places, that their philosophy and logic can afford them no legitimate aid and comfort; second, to show to the quasi-evolutionists that there is no medium between a-theism or non-theism and the rejection of their own principles of science and philosophy; third, to show to the thorough naturalistic evolutionists that there is at least one man among the orthodox who thoroughly understands them—knows them better even than they know

themselves—and who grants them all their principles, better expounded, and admits their legitimate consequences ; and fourth, that therefore the author must accept not only these principles, but also these consequences, unless he can furnish a new philosophy which shall use these acknowledged principles in combination with others and thus attain other or rather higher results. This the author believes to be possible, and that he is called to attempt it.

In accordance with our declared object, it is necessary to say that this book was not written with the view of competing for a prize, the Author's Publishing Company and its offer of prizes being both unknown to the author till the book was finished ; but on seeing their advertisement he concluded to offer them his manuscript. Had he written with a view of competing for the prize, his book would have been less valuable, more polished and tame, and less independent and original, because we all know that these latter qualities in books are not apt to gain prizes ; and hence the author would be inclined to doubt whether they have gained it now, or whether they are anywise manifest in his book, if he did not recollect that the Author's Publishing Company is independent and original in its plan and purpose and spirit, thus affecting probably the views and conclusions of its committee. However that may be, such prizes, though welcome, are not the author's ultimate object, but the discovery of the far greater prize—Truth.

WILLIAM I. GILL.

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EVOLUTION AND PROGRESS.



CHAPTER I.

MATERIAL AND MENTAL FORCE.

IN entering on this subject, our attention is at once strongly arrested by the new book of Dr. WILLIAM B. CARPENTER on Mental Physiology; and this therefore will receive considerable attention, as it propounds a popular theory on this topic.

§ 1. INCONSISTENCIES OF DR. CARPENTER ON FORCE.

One of the first things that impresses a reader unpleasantly in following Dr. Carpenter's Mental Physiology, is the discovery that he is radically inconsistent in his propositions and procedure. He affirms as his most fundamental principles that mind only possesses any active power, and that matter is wholly forceless and passive. Yet he says that mind and matter are "two distinct agencies." But there is no agency in what is passive and forceless. Causation also, even "efficient causation," is

attributed to matter. "Sensation is that primary change in the condition of the conscious *ego* which *results from* some change in the non-*ego* or external world." To *result from*, is to be an effect of. It is very evident that all through the volume, power and causation are by him attributed to matter. Matter is everywhere made to modify and control not only matter itself, but also mind, insomuch that mind often and generally appears a cipher, except as the effect of the combination and action of matter. If such an agency is not active and forceful, we have yet to learn what an active power is.

Further, if all active power is of mind, all action of the body must be mental action; and the body never stirs the soul or in any way affects it. Yet no one would ever suspect that he has any such view as this of the relation between body and mind. On the contrary, the reader will infer from the general tenor of the work that the body exerts more power over the mind than the mind over the body.

From the distinction between mind and matter, as respectively forceful and forceless, it follows that body and mind are not the same, and in logical consistency we should expect him to admit and hold the doctrine of dualism in our nature as to body and soul or spirit. If the body is the "*material instrument* of mind," and if matter is merely the *vehicle* of the mind's force, the duality of body and soul, of matter and spirit, is necessarily involved. Yet in the preface, he unequivocally indorses the following language

from Charles Buxton: "Irresistible, undeniable facts demonstrate that man is not a den wherein two enemies are chained together, but *one being, that soul and body are one—one and indivisible.*"

§ 2. DEFINITION OF THE TERMS "PASSIVE" AND
"ACTIVE."

The respective meanings of the terms active and passive, Dr. Carpenter has not definitely given. He has simply repeated old words, without determining what is their meaning, or whether they have any meaning. We demand a proof that active and passive agents or substances are not equally forces, whether called matter or mind. The passive, as passive, is known only as that which presents to some force operating on it a degree of resistance less than is necessary to remain *apparently* impassive or unmodified. The wax is passive to the seal, while the seal is active, and supposed to be impassive. But in reality, the seal is not impassive in the sense of acting without being acted on and modified; and the wax is not passive or inactive in the sense that it does not operate on the seal and modify it. The seal and the wax are in reality equally active, and equally resist each other; but the softer substance is called passive relative to the harder substance to whose force it yields and whose impress it receives. Active and passive are terms which express simply the relative degrees of resistance of two opposing

bodies or forces; and hence what is called passive in one relation will be called active in another relation. Wax is passive in relation to the seal which presses it, but not in relation to the water into which it may fall. In this latter relation, the wax is active and the water passive. The water, again, is considered as active when dashing in a flood of resistless weight and momentum against its barriers, and the latter are conceived as relatively passive.

So far as Dr. Carpenter's views approach definiteness, he seems to think that volition is the characteristic of active power, and all other change and motion is passive, forceless. But this certainly does not accord with the common notion of the relative or respective meanings of the terms active and passive. Nor will science accept such a distinction and definition without due proof; and he furnishes none. On this view the ball and the target, or the lightning and the tree which it shatters, are both passive relative to each other. But neither in popular or scientific use has the term passive ever been applied to the action of a ball or the lightning on the objects which they strike. They may be considered passive relatively to their causes, but never relatively to their effects. Here we have the scientific principle of distinction between them. Everything is conceived as passive relatively to its causes, but active relatively to its effects.

§ 3. NO BRIDGE BETWEEN EGO AND NON-EGO, NOR
BETWEEN THE INTERNAL AND EXTERNAL.

Dr. Carpenter makes matter serviceable as being necessary to bridge over the gulf between the ego and non-ego or the external world. This is unfolded in the first paragraph of page first. But a bridge must be neither gulf nor opposite shores. If matter bridges the gulf between the ego on the one side, and the non-ego or the external world on the other, it must be neither ego nor non-ego, neither internal self or the external world. But this is impossible, because self-contradictory. There is no such bridge, no connecting link or bond or *medium* between the ego and the non-ego, or between the ego and the external world.

The ego must be connected with and percipient of the non-ego *immediately*, if at all. If the body is non-ego, the spirit or ego, in its connection with the body, is connected immediately with the non-ego. If the body is ego, and if the external world is non-ego, then the ego and non-ego are connected immediately, in virtue of the body's immediate connection with the external world.

§ 4. MATTER KNOWN ONLY IN VIRTUE OF ITS FORCE.

On the nature and relations of matter and force, Carpenter starts with the asserted general admission

“that we neither know, nor can know, anything of matter, save through the medium of the impression it makes on our senses; and those impressions are derived from the *forces of which matter is the vehicle*.” When men affect to teach science and philosophy, or anything else, they should consider consistency of thought—which involves clearness and distinctness of thought—and accuracy of expression as prime requisites. We have just exposed a self-contradiction in his assured deliverance respecting matter as the bridge which spans the gulf between ego and non-ego. We have a similar criticism to make on this sentence. It is indeed a general admission, as he says, that matter external to our organism is known only by the impression it makes on our senses; but what he adds to this by way of philosophical or metaphysical explanation of it contradicts it, though the author, of course, does not see it. The general admission, an admission in which we concur, is that “it,” matter (“it” being the relative pronoun of matter), makes an impression on our senses, and so it is itself accounted a force. In Carpenter’s addition and philosophical explanation, matter is divested of force, and transmuted into a mere *vehicle* of force; and we are told now that it is this immaterial force, and not matter, which makes the impression on our senses. We accept the general admission, consistently conceived, that is, really conceived, or so conceived as not to be self-nullified, so that we have as the result a real

admission, a real thought and possible fact—that external matter is known by the impression which it itself makes on our senses, logically implying that matter is itself a force and makes itself known by its force.

§ 5. MATTER KNOWN ONLY *as* FORCE.

But while matter is known by its force in the impression which it makes on our senses, it is not merely the *impression* which is known, but the *matter itself*. We do not simply *believe* the existence of matter, we know it. Nor is our knowledge inferential, but direct and immediate, as the object of our senses. We do not conclude by logical process that there is such a thing as matter, as the cause of our sensations; for matter is itself subjectively sensitive and objectively sensible. If therefore matter is known only by its force, it is known only *as* force. The force is not known as something different from the matter, and the matter is not known at all if it is not known as the force. The matter is not an unknown thing whose existence is inferred from the force, but a known thing identical with the force. Matter, though known only as a force or by its force, is seen and tasted and handled, and it is material force or matter as force which is thus felt and seen. To the senses the force and the matter are one and indivisible, and they must be the same to the intellect. Thus by a short route we arrive, with logical

certainty and necessity, and in accordance with the testimony of our senses, at the exact contrary of his doctrine of the forceless passivity of matter—that matter is an active force or power whose kind and degree are known directly in the experience of the senses.

Besides, if matter were not force and immediately known as force, it could not be known at all, could not be rationally inferred. The operation of force could furnish no evidence of the existence of forceless matter. If force is not matter, then force can exist and operate without matter; and if it can exist and operate without matter, its existence and operation are no evidence of the existence of matter. And as matter is forceless, it can itself give no evidence of its own existence, for that would be an exercise of force. If force cannot exist and operate without matter, then force depends for its existence and operation on the forceless, which destroys itself; or force depends for its existence on matter as some property or force, and so matter and force are identified, and force depends on itself only, as it must.

Matter, it is said, is “merely the vehicle of force,” or “the instrument of force,” not force itself. Will the Doctor show us the vehicle or the instrument apart from the force; or if this cannot be done, will he give us an intelligible criterion of the distinction between the two. We have always supposed that all “vehicles” and all “instruments” have some force,

and that they are available only in virtue of their force. If the club of Hercules was intrinsically without force it was useless; for in that case, club + fist = fist only. If Carpenter's book, the matter of it, is essentially forceless, he has, in making it, been guilty of a superfluous labor of immense magnitude, and all language and printing are worse than nothing, because they *add* nothing to the force of thought. Nothing can be a vehicle or an instrument except in virtue of some property with which it is intrinsically identified; and on account of their peculiar forces, peculiar forms of matter are chosen as vehicles and instruments; and if force is not the intrinsic and essential element of all matter, then the entire panorama of the heavens and the earth is a phantasmagoria, an illusion, an imposition, and a contradiction. Its supposed Creator must be supposed to be worthy of his work—Himself an illusion.

§ 6. GOD AS THE SOUL OF NATURE.

We shall see that this absurdity is the chief or only weapon with which thorough evolution is assailed by its opponents of all stripes. Here we may observe how fluently a writer of the name of Bowne discourses on this theme in his refutation of Spencer. We will give a few extracts from him, as he is decidedly more vivacious on this subject than Dr. Carpenter or any man of science. In Spencer's writings a "ridiculous confusion of force and motion

is apparent." "But psychology has yet another word to offer to the New Philosophy. It demands the authority for the belief in force at all. It summons the evolutionist to tell where he discovered this force with which he conjures so mightily. And just here, every system of mechanical atheism is speechless. For it is *admitted now by all* (!) that force is not a phenomenon, but a mental datum. Hume did philosophy a good service in showing that nature presents nothing but sequence, and this is rigidly true! The keenest eye, looking upon the armies of phenomena which maneuver in the physical world, could detect nothing but succession. Regiment after regiment might march by us in time-order, but they could give us no hint of power. This idea is home-born, and born only of our conscious effort; it is only as there is causation within that we get any hint of causation without. Not gravitation, nor electricity nor magnetism, nor chemical affinity, but *will* is the typical idea of force. Self-determination, volition, is the essence of the only causation we know; will is the sum total of the dynamic idea; it either stands for that or nothing. . . . Science refers all change to one universal force: what is that? It is either the activity of a person, the determination of a will, or nothing. The mental law which warrants the belief in external power, warrants the interpretation of that power into the divine activity. If science likes not this alternative, then it has no warrant for belief in force at all."

This conclusion is confirmed by human superstition. "The uncultured mind in all ages has persisted in referring external phenomena to external wills. Was there a storm, Neptune was angry, or Eolus had let slip the winds. Was there a pestilence, some malignant demon had discovered the fountain of life and charged it with deadly poison. Every order of fact had its god to whose agency it was referred. . . . Absurd as were many of the beliefs begot of this tendency, it was far truer to psychology than is the prevailing scientific conception of impersonal force. Nature is the *abode* and manifestation of a free mind like our own. . . . Will-power or none is the alternative offered by inexorable logic."

This last paragraph is the stock argument of sermons and theological lectures and all theistic metaphysics. Dr. Carpenter, from dire necessity, condescends to repeat it as follows: The conviction that the source of all power is in mind "has its foundation in the primitive instincts of humanity. By our own remote progenitors, as by the untutored savage of the present day, every change in which human agency was not apparent, was referred to a particular animating Intelligence. And thus they attributed not only the movements of the heavenly bodies, but all the phenomena of nature, each to its own deity. These deities were invested with more than human power; but they were also supposed capable of human passions and subject to human capriciousness." The progress of science rectifies the errors thus involved,

without destroying the testimony of human instincts to personal agency as the only source of power. The discovered unity of nature now reveals the unity of a personal God, and this is all the difference between savage instinct and modern science.

‘ All are but parts of one stupendous whole
Whose body nature is and God the soul.’

This doctrine of God as the soul of nature is entirely agreeable to evolution, if our form of conscious and volitional activity is not imposed on God. In that case it will contain no evident absurdity or revolting paradox. But such a union of nature with the God of Theism is unmitigatedly revolting. If God acts throughout the universe by distinct volition as we do within the sphere of our organism, and if there is no force or power but His, then in the most shocking of all possible meanings “there is no evil in the city but God has done it,” nor anywhere else. There is no force in the assassin’s dagger or arm, and it is God only who kills in obedience to the assassin’s volition. Carry the thought through all the mazes of natural phenomena, and of brute violence and human vice and malignity. Every effect, however cruel or loathsome or horrible, is directly and in the most explicit sense the act of God, and of him only. Man has the power of volition, but as all nature is powerless, man can do nothing but will. There his power ends; and nothing would follow his volition but for the coinciding efficiency of

God's volition. Further, if man's soul and will are a part of the universe of which God is the soul, as they must be, then man's volition is itself an immediate effect of God's volition in all cases.

This is not merely pantheism, but it combines such horrible conceptions of the universal and eternal Power as to put it infinitely beneath all forms of impersonal pantheism. That God should operate all that takes place of evil by a distinct and deliberate volition, as a conscious "free agent," as Bowne calls Him, purposing and thus effecting each and all, is very different from working out such things by necessity of nature, in virtue of immutable force operating variously according to the relations of the parts of these forces to each other. Though the latter be called atheism, we should infinitely prefer it to the former, whether it be called Theism or by any other favored term.

§ 7. BARBARIAN BELIEF NO PROOF OF THE FORCE-
LESSNESS OF MATTER.

It is with a genuine and profound shame on behalf of Theism that we have seen a man like Dr. Carpenter condescending to support his bad metaphysics by retailing afresh the opinions of savages, barbarians, and uncultured peasants. Is philosophy to sit forever at the feet of barbarism and ignorance? Are we to accept a notion because fear or hope or vice or crime has engendered it in a brain only just

beginning to be streaked with the qualities of mentality? I grieve for outraged science and philosophy that such an argument at this date should emanate from such a source. If Carpenter had been silent here, others should have passed unnoticed, because the argument itself is worthy only of severe contempt, which even our courtesy to the author cannot restrain.

These "instincts of humanity," that is, of savages, barbarians, and peasants, find a sufficient explanation in their weakness and wants and ignorance and danger, whence they are evidently evolved or may be; so that they at least coincide with evolution instead of arguing against it. It is enough for evolution that they *may* so originate.

§ 8. INERTIA IN PROOF OF THE FORCELESSNESS OF MATTER.

Mr. Bowne resuscitates the decadent doctrine of the inertia of matter to extort from it a testimony in favor of the intrinsic forcelessness of matter. "The doctrine of an impersonal force in matter seems really opposed to the law of inertia." How dreadful that this law should even seem to be opposed! "The law assumes absolute deadness in matter; the doctrine attributes to it all kinds of activity. One doctrine is that matter cannot change its state; the other doctrine is that matter can change its state. It is for scientists to determine which they will give

up." Scientists have already determined that point. Very few of them now accept the law of inertia in its extreme meaning. It is a phrase which is very useful in an essentially modified sense. The phrase *vis inertia* is a contradiction, because whatever is perfectly inert is *vimless*, and all force or *vis* is the opposite or contrary of inertness. Newton's term or phrase of *vis insita* is much better, for this is self-consistent and attributes force to matter. The essential and characteristic conception of material inertia has always attributed to this inertia of matter a force, which resists every way the action upon it of all force in other bodies. It is not true, therefore, that "the law (of inertia) assumes the absolute deadness of matter" in opposition to "all kinds of activity," for it is always defined as the expression of force opposing force.

The law of inertia is simply a phase of the law of continuity, according to which every natural force, whether of body or of mind, always exerts itself to the utmost, and therefore until it is exhausted or overcome by an opposing force. Hence a moving body will continue to move without change of speed or direction so long as it is unopposed from without and retains its present composition. But in all or nearly all known cases, it is being constantly opposed from without, and therefore its speed, if not its direction, must be always changing. But a body at rest relatively to some other bodies will necessarily remain at rest until it is moved by some force from

without or by the evolution of some new force from within. This evolution of internal force, as well as the assault of some external force, may set a still body in motion. We see this in the processes of germination, and in all organic action, and in all explosive action. It is exemplified in all molecular motion. And molecular motion is the same in kind as molar motion, the difference being only one of quantity. Every molecule is a force, and each exerts its force relatively to and upon other molecules. The same is true of masses of matter. Hence all molecules and all masses are continually moving and changing relatively to each other in virtue of the intrinsic and relative power of each. Absolute inertia is a thing unknown.

Still more, absolute inertia is impossible to be known. Nothing can be known except by the *force* which it exerts upon us, whether by its resistance to our effort or by its assault upon us. The contrary supposition contradicts itself, because it supposes that the propertyless and markless make and constitute a mark in our consciousness.

§ 9. ALL MOTION IS FORCE.

The frequent attempt to dis sever force from motion discloses, when analyzed, an utter failure. It contradicts itself and all experience and spontaneous judgment. All known motion is followed by changes in other bodies; and the latter changes are

universally pronounced to be the effect of the former as the cause. It is in opposition argued that these causes so called are only second causes or motions which are not intrinsically forceful, but are engendered by previous motions, and the previous motions by others, till we arrive at the first motion, which is alleged to be created by the volition of God. But if we grant this recession back to God, we do not concede that all motion is not a force. We only concede that it is not the source of its own force, or an eternal self-existent force; and this we are not just now contending for, but only that it is a force, whatever be its origin; and this is conceded in the very act of referring its origin to God. Its forcefulness so long as it exists is not affected by its origin as a creature of God, else our wills are powerless, as they are supposed to have the same origin, while they are affirmed to be forceful. In all cases the creative act of God is an act of power, and the power does not perish with its inception, but continues to operate till the act is reversed and undone; so that everything that God has created constitutes a positive and intrinsic force, though borrowed from Him.

It were indeed a poor and absurd notion of a Creator that He creates only what is powerless, forceless, propertyless, inert, as that were the creation of nothing. But the Bible always affirms the creation of something real, real beings, of forces and powers, and on this ground God demands our service and homage. The perpetual acclaim of the Church

is: "We are something real and great and glorious, with powers of achieving and enjoying; and all we are we owe to Thee, Eternal Power; and in the exercise of our free power we give Thee back ourselves in happy, grateful, loving service."

It is also the Theistic conception of creation that the created differs in individual substance and in personality (where personality is created) from the Creator. To create is to cause the beginning and trajection of substance and force beyond and in addition to His own substantive individuality; else all action is only a pantheistic evolution, for there is no creation proper, no addition to the sum of being and of force. We are thus still held in the unrelaxing grip of a universal nature-force, whether that force be created or eternal. And the known existence of nature-force being conceded, we are then prepared for the question whether it is created or eternal, and to this question we shall address ourselves in due time. If created force or nature-force had an absolute beginning as substantive force substantively and individually different from its Creator, and can be so proved, the claims of Theism must be allowed. On the other hand, if it is not thus a substantive force, individually distinct from God, it is eternal in substance and force, and is identical with God himself, and this is thorough naturalistic evolution. This therefore is our final alternative: Nature's force is either the action and force of God or it is not. If it is, the universe is God, which is evo-

lution. Theists affirm that it is, and thus in opposition to evolution they affirm evolution

§ 10. MOTION AND SUCCESSION REFUTE ABSOLUTE
INERTIA.

Never was there a more patent error than the supposition that matter is so inert that it cannot move itself. It certainly does move everywhere like a bird, and more swiftly, deftly, and variously than any bird. It transcends even the power of imagination and thought, in the rapidity, multiplicity, and variety of its motions. We have the amazing molar motion of mighty orbs in the planets and stars, and we have the equally amazing molecular motion in each and all of these bodies. These motions are conceded.

The question is, do these bodies, molar and molecular, move themselves, or are they moved *ab extra* by some invisible power not immediately known? If they are admitted to move themselves, our point is gained. If this is denied, we must inquire the ground of the denial, and determine its rational force. The facts are that we know these bodies immediately as moving; and the primary presumption is that these bodies move in virtue of their own inherent forces, that is, that they move themselves. This presumption must be considered valid till it is combated by the discovery of some fact or reason of superior authority. The *onus probandi* therefore rests with those who deny the self-motion of matter.

With great gusto, our brilliant young friend and ecclesiastical clansman, Mr. Bowne, trots out Mr. Hume as the unwhipped champion of the doctrine of the forcelessness of matter. Hear him again: "Hume did philosophy a good service in showing that nature presents nothing but sequence." This is the first time that orthodoxy has sheltered itself under the wing of Hume; and it will probably be the last. For, warned by the fate of the victim of such rash and misplaced confidence, mistaken for philosophical wisdom, all others will fear to follow in the same track. Whatever was the value of the service Hume rendered to philosophy, it is certain that he meant to teach caution to philosophy, and especially, to young men, modesty on such deep themes. It is equally certain that while he denied the knowledge of causation in matter, he did the same of mind, and explicitly of the will, and all on the same ground. If his singular protégé is ready to accept Hume's entire principle and argument, the disciples of M. Comte will give him their hand. If he is not prepared for this, he must relinquish all the good service of Hume, for Hume's denial of the knowledge of internal causation has the same foundation and force as his denial of the knowledge of external causation.

Des Cartes is responsible for all the strife and confusion of modern times respecting force, energy, power, and cause. He denied that either force or cause is an attribute of matter, that one event in nature is related to another as cause and effect, or

that the mind is affected by matter, and from this denial arose the doctrine of occasional causes. This latter doctrine was transmuted by Leibnitz into Pre-established Harmony. But both Des Cartes and Leibnitz were inconsistent, as men always must be who advance so fundamental an error. And Des Cartes was received, and Leibnitz rejected. All Des Cartes's physics assume natural force and causation; and Leibnitz explicitly affirms that all things are forceful, while his preëstablished harmony denies all interaction of monads, and thus precludes all causative action. Since the time of Des Cartes all orthodox realists, all idealists and quasi-idealists, of which he was one, have explicitly or implicitly denied to man the knowledge either of natural cause or of all cause. With Hegel, the most thoroughgoing of all idealists, causation is only a dilectical process; with Hume, it is problematical, and its decision transcends the sphere of philosophy. After Des Cartes, Berkeley was the first conspicuously to announce and forcibly to defend the doctrine that matter is "inert, powerless," that power and causation belong wholly to mind, to will. He assumed or contended that we have the idea of power, that our minds, our wills, are a power, but that all the objects of the senses, whatever constitutes the so-called material world, are devoid of power, that here coexistence and succession of phenomena are all that there is, and that all were without any causal connection with each other. On this subject he is very emphatic

and repetitious. The reader will remember that Berkeley, in accordance with representationism, uniformly designates the objects of outward things (so called) by the subjective terms idea, sensation, notion. "The things which we perceive, by whatsoever names they may be distinguished, are visibly inactive—*there is nothing of power or agency included in them.* So that one idea or object of thought *cannot produce or make any alteration in another.*" (P. H. K. § 25.) Hence he deprecates all endeavors "to explain things by corporeal causes." (Ibid. § 66.) Of course, he is inconsistent with himself, like others who have adopted the same error; for there could be no "virtues of tar-water" if there were no power or energy in tar-water. In section sixth of his Principles, he speaks of a ball being "impelled and determined" "necessarily" "by the stroke of a racket."

Hume was aware of the Cartesian and Berkeleyan doctrine on these two points—the powerlessness of sensible objects, and the essential forcefulness of mind. He adopted the former, and the latter he rejected. His reason for denying power to mind as well as to body, was that the arguments by which he supposes they proved that matter is inert and powerless prove the same of mind. Here he was right in his procedure. They are supposed to have said that in the world of sense we know and can conceive nothing more than coexistent and successive phenomena. But this was not their argument, but their conclusion.

Hume said that this is also a fact of the world of mind; and that therefore, if it disproves all energy in matter, it disproves all energy in mind. No argument can be more obvious and decisive. But while he is logical in arguing *from this basis* that we have no knowledge of the existence of power, he contradicts himself in denying the *idea* of power, because his argument presupposes the idea, since it presupposes that he knows what he says and what he means. Further, while his argument against the *knowledge* of power is good *ad captandum*, it destroys itself, because the argument is an exhibition of power, and reasoning an exercise of power. As everything is qualitative, and as quality is power, the idea and the knowledge of power are the first and most ultimate idea and knowledge, and are the essential constituent of all ideas and knowledges. Hence Des Cartes and Berkeley stultified themselves in arguing against force in matter. Hume sinned against fact and logic more egregiously in denying all knowledge and even all idea of power or force.

It was the assumption of a difference between phenomena and substance and power which gave such disastrous effect to Hume's proof that all our knowledge is confined to ideas and impressions. This assumption was held with more or less definiteness by all philosophers in common with Hume. It is the assumption of a difference between power and phenomenon which has raised and perpetuated all the difficulty on the question of cause and effect.

On this assumption Hume proves that in the relation of cause and effect there is no evidence of power, because we know nothing but the phenomena of antecedent and consequent. His argument may be stated as follows: In the so-called relation of cause and effect, we know only the successive phenomena of antecedent and consequent; but neither of these is force or power; therefore, force or power is unknown. Unless we identify force and phenomena, we are compelled with Hume to deny all knowledge of power; but this denial is an exercise of power, and so philosophy is destroyed and reason is at war with itself; and this war can end only with the admission that all phenomena are forces. Admit that phenomena are forces, we know causation directly in every change of phenomena.

Hume, however, is not content with the negative assumption that phenomena are not forces. He adopted the logical converse that force or power is something different, and something else than the phenomena of antecedent and consequent. For proof, the reader is referred to the seventh section of the Inquiry concerning Human Understanding, from which we make the following quotations. "When we look about us toward external objects, and consider the operation of causes, we are never able in a single instance to discover any *power or necessary connection*; any *quality which BINDS the effect to the cause* and renders the one an infallible consequence of the other. We only find that the one

does actually follow the other." Observe that here "power" and "necessary connection" are identified; and then both are identified with "a quality which binds the effect to the cause;" that is, binds the subsequent to the antecedent. "We know that, in fact, heat is a constant attendant on flame; but *what is the connection between them*, we have no room so much as to conjecture or imagine." What connects between two terms must be a third term different from both of them. "With regard to the influence of volitions over the organs of the body" he observes: "This influence is a fact, which, like all other natural events, can be known only by experience, and can never be foreseen in any apparent *energy or power in the cause which connects it with the effect*." By cause and effect Hume means simply antecedent and consequent. Here the power or energy is not the cause or antecedent, but something *in* it, and something which connects it with the subsequent or effect. "The motion of our body follows upon the command of our will; but the *means by which this is effected*" we know not. Means is something else than agent, and something used by an agent, and so here he is seeking a medium between mind and body, a medium operated on by mind or the command of our will, which medium is in turn supposed to operate on the body and produce motion. He may well say that of "this we are so far from being immediately conscious, that it must forever escape our most diligent inquiry." "It must be

allowed that when we know a power, we know that very *circumstance* in the cause by which it is enabled to produce the effect." Here it is asserted that power, if known, must be known, not as the cause or antecedent, but as a *circumstance* in it, and yet that said circumstance is not the real causal agent, but the means "*by which* it ('the cause' or antecedent) is *enabled* to produce the effect." So the antecedent produces the effect, because it is *enabled* to do so by some circumstance in it. The agent must be empowered by a circumstance, and the circumstance, if it exists, must be known in distinction from the antecedent or agent or cause; but as no such circumstance is known, nor can be known, the knowledge of power is impossible! We see "one event follow another, without being able to comprehend any force or power by which the cause (antecedent) operates, or any connection *between* it (the antecedent) and the supposed effects." Here again the power is that "*by which*" the antecedent operates, and so something different from it, and constitutes a link "*between*" it and the supposed effect. "One event follows another, but we can never observe any *tie between* them." Have no knowledge of "*a connecting principle between* cause and effect."

These quotations make it clear that Hume assumes that power is something else than either known antecedent or subsequent, that power, if known, must be known as a third term which binds these two together. This assumption is baseless.

He attempts no argument in its support, and points to no facts in proof of it. The most that he says for it is, "it will be allowed." It has been allowed through ignorance of its meaning and logical implications, because of vagueness of thought. But "it will be allowed" no longer. It is not merely a dogmatic assumption on which skepticism has here erected its temple, but it is a self-contradictory assumption. Power operating as cause must be identified with the invariable antecedent to its effect, else we contradict the essential notion of cause, which is power operating in producing an effect. The supposition of a third term, therefore, a power and operation in time, yet neither antecedent nor subsequent to anything, destroys itself. As Hume's only argument against our knowledge of power as cause is contained in the fact that it is not known apart from antecedent and subsequent, and since power as cause, if there is any, must always be itself the antecedent, his argument proves nothing whatever except his lack of logical power.

Not only is his fundamental assumption self-destructive, and not only is he illogical in the conclusion, that power is unknown, which he draws from the evident fact that we know nothing beyond the phenomenal antecedent and subsequent; but he is guilty of blinking the real issue and inventing and setting forth a false one in the place of the real. The real question is whether there ever is any known power in operation in the relation of ante-

cedent and consequent. He has perverted it into the question whether we can discover more than two terms—antecedent and subsequent—in the relation commonly called cause and effect. This is a sophism of the most flagrant kind—an *ignoratio elenchi*. No one ever questions what he so strenuously contends for—that there is no third term. In this *ignoratio elenchi* Hume stands alone. It is his exclusive invention; and to this demerit must be added the unjust attempt to father it on other philosophers. He assumes and insinuates that in his disproof of all knowledge and notion of power he uses the same argument which Berkeley and the Cartesians had used in disproving material power. But this is a mistake. It is true that in the material world they had divorced force and phenomena, and that they had said that in the material or sensible world there is succession, or antecedent and subsequent, without any power or causative interaction among the objects. But they did not base this on their inability to discover a tie or connection or binder between the successive phenomena. Their argument was simply that the contemplation of material things disclosed to their minds no evidence of power, and that they could not conceive power except as an attribute, or as the essential nature and substance of mind. Hume's argument has not, therefore, the merit, as is generally supposed, of reducing to absurdity the arguments of preceding philosophers, and it does not here effect in any

degree the force and value of previous philosophy. The absurdity is all his own, both in its origin and in its result. It is astonishing that he should have been universally credited with all that he claimed. No man has ever been so little intelligently criticised as Hume, and his logic has never been questioned except by theologians.

Dr. Brown was right in his view of causality so far as he went. He met Hume halfway, confessing, what no one had ever denied, that the two terms of antecedent and consequent are all that we know of the relation of cause and effect. We cannot know more, because more is impossible to be known. But Brown ought to have said further that cause and effect always are and constitute antecedent and consequent, that the two latter are always powers or forces, that their very existence is a causative operation. Powers and causes are not back of phenomena, but they are and constitute phenomena; and each operates in changing and creating other phenomena.

§ 11. UNIFORMITY AND ABSOLUTE INERTIA.

Dr. Carpenter has given only one argument, and that parenthetically, for the perfect passivity of matter or its absolute inertia. This argument is as follows: "Matter is essentially passive, since when left to itself it always impresses our consciousness in one and the same mode, any change in that impression being the consequence of an agency external to

itself." This is the doctrine of inertia again, that "matter cannot change itself," that it continues as it is put or impressed until it is impressed otherwise. His way of putting it, however, has an interesting peculiarity, and shall be considered specifically. His argument is that retention of the "same mode" proves the absence of power, or, in other words, uniformity of action or of phenomena is impossible in an active agent or power. The argument requires proof. We do not see that it has the slightest foundation in reason or fact.

On the other hand, the proof of its contrary, that an active agent may be uniform in its action, is easily provable from experience and from his own principles. For if matter is entirely passive, forceless, and if mind is the only active power, and if consequently mind is seen and known in matter as its operating agent, which operation is admitted to be uniform, it therefore follows that mind, the active agent, operates uniformly, impressing us in the same mode.

§ 12. HOW CAN THE FORCELESS BE EFFECTIVE?

Besides, if matter is forceless when left to itself, we should like to know how it can operate at all, uniformly or otherwise, when left to itself. We should suppose that nothing could operate in any mode without some degree of power. We consider the supposition that it can to be a contradiction in

terms, since it contradicts the notion of force as that which can operate and produce effects.

§ 13. ON DEFINITE CONCEPTION AND FAIR
CONSTRUCTION.

It will seem strange to some readers that the Doctor's position can be so easily and so thoroughly refuted, and they will suspect some misconception of his position; and we should not be at all surprised if he should think so himself. For nothing is more common than for writers on philosophy not to know their own position. They think they do, till their statement of their position is critically examined, and then it is found either vaguely blank or self-contradictory. With all respect for Dr. Carpenter, we think that when he penned this he had no definite conception. In order to do it justice, we will examine it in the light of whatever favorable supposition can be made respecting it; and if we can thus invest it with distinct thought and a clear process of argument we shall be pleased.

Let us suppose then that he did not mean to say that uniformity of action, but uniformity of *in*action when left to itself proves the absolute passivity of matter. This supposition is intelligible. It is just the way a common man would speak; and it is a pity that a man of science cannot be as definite and clear as a common man if this is what he meant. But his language contradicts this supposition by

describing this matter as acting, since it "*impresses* our consciousness." How can it "*impress* our consciousness" or anything else if it is absolutely inactive and powerless? The supposition destroys itself; and for this reason only we did not make it at first.

Let us then charitably suppose that the phrase "impresses our consciousness" means just the reverse of what it says, that it impresses nothing, does nothing, "in the same mode." But this will not do, as it will imply that it impresses and does everything in a different mode. Let us then omit the phrase in the same mode. Now, by reversal and omission we have the definite conception that matter is entirely inactive when left to itself.

§ 14. HOW MAY PERFECT INACTIVITY BE KNOWN?

But now a new difficulty emerges, how to determine the existence of a perfectly and uniformly inactive substance? What shall be the proofs and criterion of such existence? Here we are baffled, because, if it is perfectly inactive, it cannot "impress our consciousness" in any "mode." It cannot be the object either of sense or imagination or thought.

§ 15. ON MATTER LEFT TO ITSELF.

The same difficulty is presented by the phrase, "left to itself." Left by what? What is it that is here supposed to leave matter sometimes to itself?

This is a novel way of speaking, for it assumes that the reader is familiar with the idea and the fact of matter being "left to itself." Yet it is a phrase I never saw before in such connection; and whether it contains a new idea I cannot tell, because it conveys to me no idea at all; and every possible supposition contemplated in order to fix on its possible and probable meaning is contradicted by some part of the passage itself or by his main principles.

We cannot suppose that when matter is left to itself it is left or abandoned by matter, because it is self-contradictory to suppose that anything can leave itself. We cannot well suppose that he means that some matter is left to itself by some other, because, first, his terms are universal purely, and because, second, his argument is designed to cover all matter separately and totally, and requires a universal, not a partitive construction of the terms; and because, third, such a supposition would stultify his logic, for it is very obvious that the diminution of force by the separation of bodies is no proof that all bodies are forceless, but the contrary. We cannot suppose, by matter being left to itself, he means left or abandoned by force, because, first, it begs the question, since the point of dispute is whether matter ever is abandoned by force or ever devoid of force, or can be; and because, second, we have not as yet agreed on what should be the criteria or proofs as to when matter is abandoned by force; and because, third, the supposition contradicts his primal doctrine that matter is

known only by the force of which it is the vehicle, so that when its force is wholly departed, any knowledge of matter itself is wholly impossible; and because, fourth, as matter is known only by its force, and the force only by matter, so that they are entirely unknown in distinction and discrimination, there can be no possible evidence of either their separation or of their plurality in union.

§ 16. SUPPOSED EXAMPLE OF MATTER LEFT TO
ITSELF.

Though he does not define, he gives us an example of what he means by matter left to itself, as follows: "Water, for example, would continue unchanged so long as its temperature remains the same and no decomposing agency is brought to bear upon it; but heat communicated to it occasions that repulsion between its particles" which transmutes it into vapor. This sentence has the same class of faults as those which have troubled us in the sentence we have just had under consideration. It is difficult to approach and handle it because of its utter vacuity of thought. It contains a concatenation of terms which suggest clear, separate images, such as water, heat, and vapor, and their connections in time and place; but it gives no logical unity of conception. With some readers such passages are often forceful alike from the images presented to the fancy and from the logical blindness of the whole. We

were therefore disposed to let this sentence pass unnoticed, on the principle of the futility of challenging a dumb man and demanding of him the counter-sign ; but finally concluded to challenge and demand in order to make it manifest that the man is dumb. We regret to speak thus of so respectable a man and author as Dr. Carpenter, and we regret still more that it applies to still greater men than he.

Here it appears to be supposed that the matter, water, is left to itself when it is not disturbed by heat. It seems, then, that matter is left to itself when some matter is left by other matter—if heat is matter or a mode of it—when any definable form and quantity of matter is left uninfluenced by any other form and quantity of matter. But, besides the objection to this view before noticed, no form or quantity of matter ever is entirely left by all other matter or by any matter. *All* known matter is *always* operating on all other matter, and is in turn being operated on by all other known matter without cessation. This supposition of any quantity of matter being thus left to itself is not only a mere hypothesis, but a hypothesis which contradicts all experience, and contradicts our conception of the essential relations between all portions of known matter. It is true that the relations of the various forms of matter may be changed, and that the more intimate and apparently identical the relation the greater the mutual and combined force, so that the separation and removal of part diminishes the force of the rest, which

is all that facts warrant us in saying. But this is only to say that the less is greater than the whole, whether you call it matter or force or both in one or both as two.

Again, though water will not vaporize without heat, yet as heat is known only as a mode of matter, and as a mode of matter is matter, the force appealed to is matter so far as we know, so that the vaporization of water being caused by heat is no proof of the powerlessness of matter. If heat as known were known to be immaterial his argument would be good. But, however subtle, it is known as material only, as an object of sense and as a bodily sensation.

Further, if water is left to itself without heat, while it will not have the power to vaporize, it will have a new power which it had not before, or (which is the same thing) could not exercise before; the power of turning to ice, and of appearing and operating as a hard solid substance, and in this condition performing great and countless feats impossible to the liquid state. Hence we may even raise the question whether the force of water is in fact diminished by the extraction of heat. Its gravity is not thus diminished, and gravity creates all motion, and thence all heat and all subordinate forms of motion and force. Indeed, the supposition involves many metaphysical questions which are yet undetermined, and in the present state of philosophy undeterminable. This very notion of separating or uniting heat and solids or liquids is based on an obsolete theory of

heat, the theory of caloric as a gas or fluid, as free or latent; for it is only on this theory that the supposition of such union or separation is possible. Hence a body is cold if all its caloric is extracted, and so the ice is supposed to be the water minus its heat. But if we rub the ice it "gives out heat," and will continue to do so till it turns to water, and then the water will do the same if the friction is continued. Whence it appears that ice and water equally contain heat, and give it out in proportion to the friction to which they are subjected. We evidently want a better philosophy of matter and force than Dr. Carpenter has attained.

§ 17. BEFOGGING AND IRRELEVANT EXPOSITION OF
SCIENCE AND LAWS OF NATURE.

In accordance with his denial of the identity of matter and force; Dr. Carpenter affirms that the laws of nature are only laws of the sequence of forceless phenomena, "phenomenal uniformities without any coercive power whatever." Theistic theology and metaphysics have quite generally advocated this doctrine; and it is either hinted or expressed by almost every recent opponent of a radical evolution. But, though it has been uttered by such men as Dawson and Winchell, we were not prepared to hear it from such a man as Dr. Carpenter. We cannot but regard it as being anything more than an intellectual expedient, to avoid the avowal or

the distinct mental acknowledgment of a thoroughgoing naturalistic evolution, which would perhaps jeopardize his theological quietude, which is sometimes dearer than truth. It is generally more agreeable to be inconsequential than to be in mental suspense; and a war between old and new faiths or new doubts is less tolerable to some than a war between logical antagonisms.

Dr. Carpenter here shrouds himself in some very irrelevant if not foggy remarks about the nature of science and the formulation of facts. "It should be clearly understood that science is nothing else than man's intellectual representation of nature—his conception of the order of the universe in the midst of which he is placed. That conception is formulated in what he terms *laws of nature*; which, in their primary sense, are simply expressions of *phenomenal uniformities*, and have no *coercive* power whatever." We cheerfully concede that "science is nothing else than man's intellectual representation of nature—his conception of the order of the universe," for what less could science be than a "conception" and an "intellectual representation" of the "universe" and its "order;" and whose should this conception and intellectual representation be but man's? We also concede very cheerfully that these conceptions and intellectual representations are "simply expressions of phenomenal uniformities," for what more could they be than expression, and what more could they express than "phenomenal uniformities," including, of

course, what these phenomenal uniformities actually contain and logically imply? We further concede with equal alacrity that these *intellectual representations* of nature, these *conceptions* of the order of the universe, these *expressions* of phenomenal uniformities, have no *coercive* power whatever over "nature" or the "order of the universe" or phenomenal uniformities. But while our *conceptions* have no coercive power over phenomenal uniformities, it does not follow that these uniformities have no power over each other, which is the point to be considered. These uniformities are not abstractions, and they are not conceptions merely, else our conceptions would not be representations and expressions of them. Now the question is what are these uniformities? Are they not composed of coexistent and successive things, facts, realities; and if so, are these things forceful or forceless? To these questions all definitions of science and all talk about conceptions and intellectual representations and formulations of phenomena, are utterly irrelevant; and their introduction in such a connection betrays and propagates only confusion and blindness. To observe that things have a uniformity of succession or to conceive and formulate this fact, is one thing. To determine the fundamental attribute or characteristic of each and all of these things, is another. Phenomenal regularity is one thing; its cause is another; and the latter is our inquiry, an inquiry whether their cause is intrinsic or extrinsic.

That its cause is intrinsic or from its own essential nature as a force is a necessary corollary from Carpenter's primal principle, that matter is known only by its force. All the "phenomenal uniformities" of sense belong to the category of matter, and the force by which they are known is known at the same time and in the same way as they are known; so that there is no possible discrimination, much less separation, between the cause or force and the "phenomenal uniformities."

§ 18. THE THREE THEORIES RESPECTING THE COGNITION OF MATERIAL FORCE.

Let us take the most ultimate of all physical facts, the law of gravitation. We find as a fact, so far as our knowledge extends, that masses of bodies move toward each other with a velocity directly as the mass and inversely as the square of the distance. This is our actual experience, the objective fact, and not merely a subjective formulation of fact. This is all that we know of the law of gravitation—a series of observed facts or a series of experiences, or a series of sensible phenomena. Now these facts or phenomena, these very objects of our senses, are themselves forces or they are not. If they are, then our point is gained. If they are not, then material forces or the forces of matter are not immediately known to us, but are known only mediately through and by the forceless phenomena or objects of sense. But

this is exactly the contrary of his own doctrine that the objects of sense are known "*by*" or through the force with which they impress our organism.

Both these contrary positions are absurd, a misrepresentation of fact and a self-contradiction. One is that phenomenal matter is immediately known, or known by the senses, but that material force or the force of matter is not, and can only be attained by an inference of the intellect. This is the theological philosophy of perception, and has been reasserted explicitly by Mr. Bowne, with the tip of Hume's wing over his shoulder. The other position is that material force is immediately known in its operations on the senses, and in and by this operation of force material phenomena are known. This is Carpenter's doctrine, though it is nothing peculiar to him. It is quite prevalent. Those who hold its opposite are constantly appropriating it according to the exigencies of their argument.

There is a third class, which identifies matter and force, or at least never makes an explicit distinction between matter and its force. Dr. McCosh is the best representative of this class, and from him we will quote a few good sentences, as follows—(see *Intuitions*, pp. 232 and 132):

"Cause implies a substance with potency. This doctrine was explicitly stated and defended by Leibnitz, and has been incidentally admitted by many who were not prepared to adhere to the general statement. We decide, and must decide, that every

effect proceeds from one or more substances having potency. If a tree is felled to the ground, if the salt we saw dry a minute ago is now melted, if a limb of a man or animal is broken, we not only look for a cause, but we look for a cause in something that had being and property, say in the wind blowing on the tree, or in the water mingling with the salt, or in a blow being inflicted on the limb by a stick or other hard substance." Here the assumed or alleged causes are visible, sensible, phenomenal; and we all know that Leibnitz, whose doctrine McCosh here declares he sets forth, held that matter is a force, that force is its essential element and characteristic, in diametrical opposition to Des Cartes. Again, "In all our knowledge *through the senses we know objects as affecting us.*" "In certain, if not all our original cognitions through the senses we know the objects as exercising potency or property; . . . for what, I ask, are properties but powers?" He expressly rejects the doctrine that only by the will we have the knowledge of power. "I demur, indeed, to the view maintained by some philosophers of eminence, that our idea of power is obtained exclusively from the consciousness of the power of the will over muscles."

§ 19. ON FORCE AND GOD AS THE MEDIUM OF THE
KNOWLEDGE OF MATTER.

One or other of these three positions we must occupy. Which shall it be? Shall we take the doc-

trine that phenomena are known only through the medium of an extraneous force, that phenomena are immediately *unknown*, that force as something other than matter and its phenomena is known immediately, and that through the medium of this force we know material phenomena? The explicit announcement of such a theory or doctrine is its refutation. It has never before received a definite and explicit statement, and we have no explicit adherent or advocate of it. But this is the only form to which the statements of Dr. Carpenter can be reduced, unless we construe him to mean what he explicitly denies. He says, on the one side, that material phenomena are not themselves forces, that they have no coercive power, that God is the one only power of nature, and we suppose that material phenomena are not God. On the other hand, he says expressly that "we neither know nor can know anything of matter save *through the medium* of the impressions it makes on our senses, and those impressions are only derived from the forces of which matter is the vehicle." Matter, then, is known only *through the medium* of the impression of force, or in other words through the medium of the operation of force, which force is not matter, but something that rides in the vehicle of matter. Matter, then, is not known immediately, while force is, and the latter makes known the former. So we have matter as the *vehicle* of force, and force as the *medium* of the knowledge of matter; and as the force is God, we know Him immediately, and through Him we

know His work and vehicle, matter! This is interesting from its novelty and the marvellous combination and relative consistency of its parts, and for its entire reversal of the generally accepted method, according to which we look through nature up to nature's God, instead of looking through God up or down to nature.

It is common to say that we know matter or that we know mind by the force it wields, without designing to say that the latter is a different entity from the former. Carpenter's peculiarity is that he has attached this design to this phrase as concerns matter, at least.

Now by matter Carpenter, like everybody else, means the objects of our sense, as "water," "our body," "the brain," and all other forms of sensible phenomena, and so he sometimes designates matter by the term phenomena or physical phenomena; and yet, without discerning his self-contradiction, he implicitly denies that this matter or these phenomena are known except through the medium of another entity—force. We need say nothing more in exposition or refutation of such a theory. With an appeal to consciousness whether matter and the force of matter are not immediately known without distinction and discrimination as one, we leave the subject with the reader.

We will, however, before leaving it, notice one more sentence in proof that our exposition does him no injustice. He says (p. 10): "In fact, instead of

matter (as some affirm) being the object of immediate cognizance, there seems valid ground for the assertion that our notion of matter is a conception of the intellect, force being that externality of which we have the *most* direct—perhaps even *the only direct*—cognizance.” The “*direct*” or “*immediate*” cognizance of matter is here plainly brought in question; and force as something different and contradistinguished from matter is affirmed to be “perhaps the only direct” object of “cognizance;” and that accordingly “matter is a conception of the intellect” only, and not an object of sense. But his habitual mental haziness on the abstruser points in his book, just where mental clearness and explicitness and verbal accuracy are of supreme importance, could not let him express the last idea thus simply and clearly. He must needs have a verbal superfluity which is confusing and blinding. Instead of saying simply, “matter is a conception of the intellect,” he says, “our notion of matter is a conception of the intellect,” which is an identical proposition. Of course, “our *notion*” of anything is an act of the intellect, and may be called a conception. But our notion of a thing is not the thing itself; and it is matter, and not the notion of matter, that he is here speaking of, as his sentence begins with matter, not the notion of matter. This confusion of thing and our notion of a thing is, as we have seen, exemplified in his confusion and identification of nature’s forces and laws with the conception or our notion of them. (P. 692.)

§ 20. MATERIAL AND MENTAL PHENOMENA ARE
EQUALLY FORCEFUL OR FORCELESS.

Shall we then adopt the first, that material phenomena only, in distinction from force, are known directly or by the senses? Is it true, as is very commonly asserted, that in the action of the senses we do not recognize force, but only sensible phenomena in coexistence and succession? Those who affirm this must either deny all knowledge of power, like Hume and M. Comte, or they must show some other method than sense by which this knowledge is attained, and then they must show why they attribute force to matter while denying that any sensible matter is forceful or is a force.

Hume said we know nothing of material force, because we know nothing of matter except from the senses, and the senses know nothing of matter except as coexistent and successive phenomena. Our theological philosophers adopt this; and then sing a pæan of triumph over the defeat of naturalism and evolution. But not so fast, dear friends. Hear Mr. Hume to the end of his argument. Do not interrupt him with your senseless and deafening gong in honor of your fetish. This chosen champion of the powerlessness of phenomena proceeds to say, that what is true of the senses and their objects is true of the intellect and its objects. The external and internal worlds are here perfectly analogous. The mind

never transcends phenomena. Phenomena in coexistence and succession are all it knows. If these phenomena are not forces the mind knows nothing of force. If these phenomena are forces, the external phenomena with equal reason must be pronounced forces. If, therefore, our ready gong-ringers accept the first part of Hume's exposition, they must, in logical consistency, accept the second part with equal heartiness and vigor.

But here they demur. There is one department of the internal world, they say, which is peculiar, and in which we directly see Mr. Force at work. His workshop is the will, and he operates all our volitions. Mr. Hume replies that he admits the existence of volitions, but that he is unacquainted with Mr. Force, and that he knows volitions only as a species of internal phenomena existing like all other phenomena in coexistence and succession, and as having a temporal relation with all other phenomena, mental and material, as all other phenomena have a temporal relation to each other and to these.

That muscular movement and other phenomena follow volitions with great regularity is true, though here our purpose and expectation are often disappointed. And it is equally true that our volitions with equal regularity follow muscular action and other phenomena. Hence there is nothing whatever to distinguish the phenomena of volition from any other phenomena in regard to force. If other phenomena are forces, these are forces. If these are, all

others are. If others are not forces we have no reason to pronounce these to be forces. Either all phenomena are forces or no phenomena are forces, because in the question of force they have all an equal evidence. Such is the procedure of Hume. Let him not be mutilated, as he is by Bowne, nor least of all, mutilated and an available part of him appropriated without acknowledgment, as our theological phenomenologists often have done. But to adopt Hume fully is philosophical and theological skepticism, which will not suit either us or our opponents; and to adopt him only in part would be logical self-stultification, which also must logically result in philosophical skepticism, whatever be our theology. We therefore reject his doctrine entirely. Our theological phenomenologists must therefore retire from the lists of philosophical combatants. If they wish to retain their logical incongruities they may be allowed their freedom, but they must drop all pretensions and all claims on the score of philosophy and logic.

If neither of these two opposite theories are possibly true, there remains only the third, that matter and force are identical, are one and the same, and that for this reason in knowing matter we necessarily know force, and that in knowing sensible force we know matter. If we are cognizant of force at all, and if yet our knowledge does not transcend phenomena, then we are cognizant of phenomenal force. If we are cognizant of force by the senses, and therefore, thus cognizant of sensible force,

and if the senses cannot transcend phenomena, then we are cognizant by the sense of phenomenal force, and material force is phenomenal and sensible. This accords with universal intuitions and spontaneous judgments, which never separate force and phenomena, nor make matter and its forces to be anything other than the object of our senses. For all men, from peasant to philosopher, ascribe some force to sensible phenomena. Carpenter himself does it all through his writings just as Hume did.

§ 21. MATTER IS FORCE BECAUSE IT RESISTS FORCE.

It is our sense of force resisted, says Carpenter, that gives us our first and only sure knowledge of force; whence he infers that force is wholly volitional or at least mental. "When, however, we not only look at bodies in motion, but try to resist their motion by an exertion of our own, or use a similar exertion in giving motion to a body at rest, we are led by our own sense of the effort in making it to an entirely new conception, that of force; and no advance in the philosophy of science has been greater than that which has of late years extended the notion of force. . . . The man of science of the present day is thus enabled to attach a distinct idea to that *efficient causation* which logicians have continually denied, but which the common sense of mankind has universally recognized. When the cause of any event is spoken of in common

parlance, we certainly attach to the term the idea of *power*."

This is not consistent with itself and other parts of its author's doctrine. Here against the logicians he argues that matter has or is "power," that this is the essential notion of a material "cause," whence its action or motion is "efficient causation." Now if he means that the matter itself is thus forceful and causative, as his language explicitly affirms, then his basal principle is destroyed, that all power is of mind in distinction from matter, which principle is here subsumed by him, according to which our first notion of power is derived from our volition, so that all known and conceivable power is mental and volitional. If, on the other hand, he here means that matter is not forceful and causative, a supposition which flatly contradicts his language, then he agrees with the logicians whom he professes to oppose; and he opposes what he calls the universal judgment of mankind, with which he professes to agree. On the former supposition he establishes our doctrine against himself. On the latter supposition he sides with the logicians against universal common sense.

Passing these self-refutations, and admitting at present for the sake of argument that our notion of power or of force is first found in the consciousness of effort in resisting motion or in generating motion, yet it does not follow from this that force is only of the will. The exact contrary of this is a logical necessity. There must be force in the object

resisted as well as in the will resisting, in the object which requires effort to move it as well as in the subject which makes the effort. Nothing but force can resist force, and there can be no effect without an object resisting as well as a will in exertion. These are two correlatives which are absolutely inseparable even in thought, as the contrary thought is self-contradictory. The equality of action and reaction is both a fact of experience and a logical necessity of thought. Our will-force and the force of what opposes our volitional effort are known equally and together.

Now that opposing force, which is thus known as a condition of any effort being known or made, is always known as matter, and called matter. They are the objects of our senses, or sensible phenomena, which resist our effort to stop their motion, or which resist our effort to set them in motion. Thus we see that we do not know our own power, or the force of our own will, except on the condition and in the act of knowing matter as a force. As Carpenter truly says, "efficient causation" is a property of matter, and we do certainly attach to matter as cause the idea of "*power*."

§ 22. VOLITION PRESUPPOSES THE NOTION AND
KNOWLEDGE OF FORCE.

But it is a mistake to suppose that the consciousness of volitional effort and resistance to it gives us

the first *notion* of force. *The notion of force is prior to all effort, and a condition of all effort and of all volition.* Every volition has an end in view, and assumes that thus the said end is attainable; which is only to say, that it presupposes the notion of power, and the known or probable possession of power, and that this power may be employed for the fulfilment of a desire and purpose. Thus the notion of efficient causation precedes all volition as equally one of its practical and logical conditions. All action and all volition necessarily presuppose the notion of force.

§ 23. WHATEVER IS IS FORCE.

All thought, all conception of anything, involves the notion of force. Everything is necessarily conceived as having or as being some property, and all property is force. A sensible property objectively considered is a power of producing some impression on the senses in certain relations. Subjectively considered, it is a power of receiving impressions and of being thus cognizant and conscious of organic force external to our organism as well as within it. A property of mind or mental property is a mental power. Nothing, and only nothing, can be propertyless and forceless. Without any property, there is no power or capability of achieving or affecting or of being affected; and such a thing is unknown, unknowable, and inconceivable; and the supposition of

such a thing is self-contradictory, because the supposition of anything implies the conception of some property as a discriminable mark in consciousness. Therefore, whatever is is force, whether it be called matter or mind.

§ 24. WILL-FORCE AND NATURE-FORCE.

It is not, of course, denied that we have the power of volition. This has never been denied. We only deny that this is the only known force, or the first origin of the notion and knowledge of force. In regard to the will, the only question bearing on evolution is, whether its volitions are the exercise of a natural or of a supernatural force; or, in other words, whether its action transcends the known and accepted law of cause and effect which everywhere prevails in the universe of nature; whether, in spite of all natural forces, and in opposition to all natural forces, both internal and external, the will can determine its volitions, so that there is no absolutely certain and uniform and causal connection between volitions and antecedent phenomena. Let it be made manifest that the will is really a supernatural power, superior to all natural force, and its action entirely independent of the law and the force of natural causation, then we shall have a basis on which to build a system of supernaturalism in opposition to naturalistic evolution.

Before this is possible there will have to be a

better mutual understanding among the orthodox. Those who proclaim most loudly the freedom of the will, are by no means clear that the will is strictly and fully a supernatural power; and nothing less than this will save them. And if they proclaim this supernaturalness, it remains to prove it to the satisfaction of their opponents, orthodox and heterodox, for they have both classes of opponents. A large proportion of the orthodox, and some of the first class in mental power and culture, like Dr. McCosh, not only admit but earnestly maintain as of very great importance that the law of cause and effect holds in relation to the will as really and as certainly as in any other relation. And this class have in the past been generally disposed to question the theological orthodoxy of those who reject this metaphysical doctrine; and now they are conceived to be orthodox only by logical inconsequence or in inconsistency with their freedomism, which is supposed to be inconsistent with the divine omniscience and sovereignty and the evangelical doctrine of efficacious grace.

This is not the place to discuss this question, because the existence of natural force, not the denial of supernatural force, is our object here. Evolutionists may leave the latter to take care of itself, till the orthodox are agreed among themselves on the question. Till then they may pursue their even way, leaving their opponents to fight each other on the question which divides them.

§ 25. EXPERIENCE OF FORCE WITHOUT VOLITION.

Besides, an appeal to consciousness will elicit abundant testimony to the fact that *irrespective of our volition* we experience the operation of force from without. In fact, a very large proportion of our experiences of power are involuntary. Projectiles which strike against us, the action of wind, hail, rain, or snow, anything falling upon us from above, any body that pushes or strikes against us when we are still and without volition to move or resist motion, are exemplifications of this.

Hence, active verbs, or causative verbs, as they may be called, are in all languages constantly applied to all antecedent motions. We cannot think or speak without it. The writings of those who deny force to matter are full of terms, phrases, and sentences attributing force to material phenomena. Examples are too numerous for quotation.

§ 26. IDENTITY OF CAUSE AND CONDITION.

From the foregoing exposition of force we shall see at once the futility of the distinction which Carpenter makes between material and dynamical categories of things, the former supplying the conditions, the latter the force or power by which they are operated. There are no material conditions which are not also dynamical conditions or forces.

Causes and conditions in nature cannot be discriminated, because both are determined by the same law, that of uniform sequence. A cause of this or that is always without exception determined by its local and temporal relation. Between every cause and effect there must be a connection in time and place. Hence an alibi disproves a charge of crime, which otherwise it would not do.

But while connection in time and place are necessary to prove causal connection, it is not every local and temporal connection which constitutes or proves a causal connection. A man may be present where a murder is committed, and yet be entirely innocent, or an apple may fall where an insect is found dead, and yet not be the cause of the death. Something more than local and temporal connection is therefore necessary to constitute a causal connection. There must be the operation of force in one object upon another, and the transformation of force and its transfusion or transmission from the cause to the effect. This *constitutes* causal action.

But still we want to know what is the *proof* of causal connection. The *fact* and the *proof* of the fact or the criteria of the discriminated knowledge of the fact are two different things. We have seen that local and temporal connection are elements of this proof; but that of themselves, irrespective of all other considerations, this is not enough. We advance to the further element of this proof that this local and temporal connection must be such that the event

would not take place without it and will certainly take place with it. Thus far all will at once agree.

But now comes the final question : How may we know that any known temporal and local connection between objects is of this character ? Here is the only possible point of difficulty and of disagreement. Yet even here there is no disagreement anywhere except in the *theological application* of the subject. Everywhere else in all cases it is agreed theoretically and practically that comparative uniformity of sequence is our only test and criterion of causal connection ; and the dissident theologians themselves always use this principle in all directions but one ; and even in this direction they often use it while they disavow it.

It is thus that we determine that light, heat, air, and moisture, and human labor, have a causal connection with vegetation ; that one wound is caused by a pistol, another by a sabre, another by a bludgeon, another by stricture ; that some bodily phenomena are the effects of one disease, and others of another ; that poisons are medicines, and one a medicine for one disease, another for another. It is thus that we ascribe certain phenomena to the causal action of intelligence and to motives prompting and ends sought in the action, in virtue of which we draw conclusions respecting degrees and kinds of mental power and moral worth and good or ill desert. It is on this principle that the theological argument from design is based ; for it assumes that there is a causal

connection between phenomena, and that the regularity of the phenomenal connection is proof of this and of the purpose of the cause.

But this criterion of causation or a causal connection is our only criterion of phenomenal or material condition or conditioning connection. A phenomenon without which an event may occur or with which an event may not occur is not a condition, but only a contingent antecedent or concomitant. A condition is absolutely uniform in its connection, and therefore so far as we know necessary. And this is all that we can ever show as a proof of cause; so that there is no logical or conceptual distinction, nor any known difference in fact, between the proof of a condition and a cause.

There are two classes of causes which are *verbally* discriminated as conditions and causes. The possession of garments is a condition of dressing, and of keeping warm in certain conditions of the weather. But if the garments in connection with putting them on and wearing them are not themselves causal, they cannot shield us against the cold. If they are without property or power they can do nothing, and cannot even be put on. *Some forces are conditions of certain operations of other forces.* But so far from their not being forces because they are conditions, *they are conditions because they are forces.* It is the failure to discern this which has created and perpetuated the long-standing difficulty and strife on the relation between conditions and causes. Voli-

tion is admitted to be a force; but one man's volition may be a condition of the volition of many other men. Is it therefore uncausal? God's volition may be, and is, a condition of some of mine. Is the divine volition here without force? We trust that this doctrine of forceless conditions will now be forced to retire to limbo.

Observe, we do not say that causation is merely sequence, but the contrary; for all sequences are not causal. We only say that our only *proof* of *real* causation in any sequences is the known comparative uniformity of such sequences. Irregular sequences are declared uncausal, regular or uniform are declared causal.

§ 27. DYNAMICAL FORCES AND MATERIAL CONDITIONS ARE ONE.

The first example which Dr. Carpenter gives in illustration of the distinction between dynamical force and material conditions is as follows: "Thus in a steam engine we see the *dynamical* agency of heat made to produce mechanical power by the mode in which it is applied—first to impart a mutual repulsion to the particles of water—and then by means of that mutual repulsion to give motion to the various solid parts of which the machine is composed. And thus, if asked what is the cause of the movement of the steam engine, we distinguish in our reply between the dynamical condition supplied by the heat,

and the assemblage of material conditions afforded by the collocation of the boiler, cylinder, piston, valves, etc."

Instead of showing us forces on the one side and forceless conditions of the action of force on the other side, this passage only shows us different classes or kinds of force. "The dynamical condition supplied by the heat" is no more necessary nor more truly force than are the boiler and cylinder which confine the steam, or than the frame and wheels which support the boiler and the fire which generates the steam. Every atom in the engine, as well as in everything else, exerts force, and force of various kinds, and in different forms and connections it produces different results. His material conditions are just what in mechanics are known as statical *forces* in distinction from dynamical forces; and the two classes of forces are recognized as essentially one, differing only in the form, either of which in reference to any body may be transmuted into the other.

Accordingly, these dynamical forces and material conditions are mutually convertible, which proves their essential identity, so that if either is a force, both are forces—one and the same force.

Again, we inquire whether these dynamical forces are matter or not. If heat, as the representative dynamical agent, is not matter, but spirit, it will necessarily evolve a strange metaphysics, as spirit is thus made visible, audible, mobile, and constantly changing its incarnations in a more won-

drous way than even modern science had prepared us to expect. If, further, this spirit-power is God, as Carpenter affirms of all the forces of nature, then our new metaphysics grows still more wonderful.

But whether they are spirit or matter, God or nature or man, we know that these dynamical agents are identical in everything but form with the material conditions from which they are here discriminated, else the doctrine of the correlation and equivalence of *physical* forces is a mistake, a doctrine which has now no opponent among men of science. Theologians question the correlation of physical forces with vital. But this is as far as they care to go, no one questioning the physical correlation.

In relation to Carpenter, the phrase correlation of physical forces, in distinction from mental, is equivocal, because the question is now being debated between us whether there is any physical force or whether all said force is not mental. But we can put the accepted meaning of this phrase in language which even in this connection will not be equivocal. By physical forces, then, is universally meant physical forms or sensible forms or objects, whatever is the object of our senses; and the doctrine affirms the absolute mutual convertibility of all physical forms or all objects of sense, of the dynamical and material so called. In the early period of the investigation and discussion of this doctrine, physical forces were conceived and spoken of as if they were not

physical, as if they were something different in their essential nature from the grosser, heavy, hard material things; and from this a mental divergency and verbal equivocation has continued down to the present time. But the most intelligent and thorough scientists in expounding this doctrine are now definite and clear in the assertion of the mutual correlation and convertibility of all physical forces and forms, that the most gross forms are converted into the most ethereal forces, and the latter again into the former. Solid carbon (and all pure carbon is solid) is transmuted sunbeams, and the heat generated by its consumption is transmuted carbon. Unless we reject this doctrine we must identify these dynamical and material conditions and make both to be a force, and essentially the same kind of force whether we call it matter or spirit.

Still further, in the last analysis, all these forms are known only as a mode of consciousness, and thus all forms alike are a mental force. While this accords with Carpenter in making all force mental, it precludes what is his special object, the exclusion of a certain class of physical objects from the category of mentality and force. If all force is mind, and if all that is known of matter is force (which is the assumption, else the distinction between mind and matter is again destroyed), then the crassest matter so called is mind and force. Dr. Carpenter appears at times to lean to idealism. But let him be consistent and thorough; and if the dynamical agencies of

matter are made subjective, let him do the same of the material conditions. We shall here make no objections to that, because our end is gained—the acknowledgment of matter as a force.

§ 28. UNITY OF POWER PRECLUDES DUALISM
OF MATTER AND SPIRIT.

Those who deny the intrinsic forcefulness of material objects, affirm the *Unity* of the Power which operates these objects; and as Theists or as anti-evolutionists of some kind, they identify this Power with Deity. Now it ought to be obvious to them that if there is only one known power there is only one known substance and only one substance to be inferred, so that we are logically compelled to affirm the substantive unity of matter and Deity. It is a marvellous logical phenomenon that gifted and laborious minds, who suppose themselves endowed with rare perspicacity and logical acumen, should affirm the unity of power and the duality of substances, thus affirming the existence and knowledge of one substance which is without attributes! The arena of metaphysics reveals a scene of greater and more comical wonders than all the rest of the universe can show.

“The culminating point,” says Carpenter, “of man’s intellectual interpretation of nature may be said to be his recognition of the Unity of the Power of which her phenomena are the diversified manifes-

tations. Toward this point all scientific inquiry now tends. For the convertibility of physical forces, the correlation of these with the vital, and the intimacy of the *nexus* between mental and bodily activity, which, explain it as we may, cannot be denied, all lead upward to the same conclusion." Now what is that conclusion. That "the source of all power is mind," that is, in mind to the exclusion of matter, else it were pointless for him, and agreeable to us, by identifying force and matter. This conclusion we reject, because, while admitting this unity of power, we see it equally manifest in matter and mind, though in mind it is manifest in higher forms. As we know but one power, and as substance is known only by its powers, we know but one substance under the two main forms of matter and mind.

CHAPTER II.

THE PHILOSOPHICAL FOUNDATION OF EVOLUTION.

§ 1. CONDITIONS OF CONCLUSIVE DEBATE.

WE can never reach a decisive conclusion till we understand our own processes, and so far analyze them as to make of them the best and most legitimate use. A defect here is one of the elements of weakness in the discussion of creationism and evolution. The advocates of evolution sometimes decry metaphysics, though without metaphysics they cannot move a step, and their theory is necessarily supported by metaphysical arguments and based on a metaphysical foundation. Dr. Huxley, however, who is perhaps the most analytical mind among modern physicists, has clearly shown the folly of discarding metaphysics.

§ 2. TWOFOLD BASIS OF EVOLUTION.

The basis of evolution, as of all natural science, is twofold, physical and metaphysical; and it is necessary to determine what we owe to each of these, what is their respective force and office, and in regard

to which of the two, if not in regard to both, modern science is distinguished from previous ages.

§ 3. WHAT PHYSICS REVEALS ON THIS SUBJECT, OR
THE PROVINCE OF PHYSICS IN EVOLUTION.

The progress of physical knowledge in modern times is very evident and striking. Our indebtedness to this is great and incalculable. So far as our knowledge has extended we have found that nature is uniform, and that there is a uniformity of correlation in or between all *known phenomena*. Here is a sublime series of facts which constitute a law of nature and extends as far as our knowledge extends. This is the physical side of evolution, and it is all there is of the physical. The senses and scientific experiment can say nothing more. They cannot say whether this law extends beyond the region of our observation, nor whether there is aught else than phenomena, and they must be silent respecting causes and effects, except as these are considered as merely tautological terms for coexisting and successive phenomena.

§ 4. PROVINCE OF METAPHYSICS IN EVOLUTION.

Whether cause is or is not something more than succession, and if it is, how it is to be discovered and determined; what is nature, how it is operated and how much it achieves, whether it is intrinsically

a force and is self-existent and self-sufficient, or whether it is intrinsically forceless, and is operated by a supernatural agent—all these are metaphysical questions, and they are infinitely the most exalted and important. Now the theory of evolution, as a theory, is metaphysical, and is concerned wholly with the latter class of questions. We could have the physical facts which are associated with this theory, though we reject this theory and all other theories of the origin of the cosmic universe. The question of the truth of evolution is therefore exclusively a metaphysical question. It may be reduced to this alternative, whether nature is an intrinsic force of the kind and degree that makes it self-sufficient for the production of all known phenomena; or whether the assumption of a supernatural agent is necessary for the philosophical explanation and scientific conjugation of these phenomena? As this is a metaphysical question, it demands a metaphysical answer, and no other answer will suffice. Hence all supposed arguments on either side which constitute only an exhibition of physical phenomena, showing *merely* the closeness or the distance of the physical connection of different orders of beings, are unavailing, except so far as the exposition is based on accepted metaphysical principles. When the metaphysics of evolution are understood, it may appear that physical proof of close or immediate connection between such orders is not necessary for the maintenance of evolution, and that all that its argument requires is

the possibility, not the known or proved actuality, of such connection.

§ 5. THE BASAL PRINCIPLES OF EVOLUTION.

The first principle essential to the theory of evolution is that *nature is a force*, that *matter is a force*, and that *as a force it operates, all parts working on each other*. This principle has the support of the native convictions and assumptions, if not intuitions, of mankind. That matter is a force is susceptible of demonstration, and has in the first chapter been duly proved. Further proof is the less necessary because some in all parties now admit the principle. Even Dr. McCosh, one of the most conspicuous of the metaphysical opponents of evolution, admits it very distinctly as follows: "It seems clear to us that we cannot know material objects, that we cannot know our own organism, or bodies out of it, except as exercising *property, that is, power*." (D. G. p. 521.) M. Comte was evidently at fault with himself in denying that we have any notion of cause or the operation of force; because if nature is not conceived as a force, we cannot conceive it as achieving anything; whence it must follow that the sole operator of all things is supernatural. It is here that modern science falls away from Hume, who denied all known cause, and that phenomena are causes, or that we have any notion of cause. We do not know unphenomenal causes, but in phenomena

we know the operation of forces, and only as forces are phenomena known.

The next position occupied by the metaphysics of evolution is that *the kind and degree of forces in nature are to be determined only by their effects*. In this the adherents of evolution have the support of the whole metaphysical fraternity. It is a principle which has been admitted by all parties in all ages, and never disputed, that "the cause is known by its effects."

The next principle is that *the effect in relation to its cause is determined by uniformity of connection*. No other test of the cause of any phenomenon in nature has ever been advocated or suggested.

These three principles may be expressed in one sentence, that *nature is a force or cause, which is known by its effects, and the effects in relation to their cause by their uniform connection with certain antecedents*. In the light of this threefold principle all phenomena are pondered and their connections investigated. *The result of such investigation is that all known things have a law of connection and dependence, and are therefore related to each other as cause and effect, that they form a unity of force which is never increased or diminished, but only changed in form, that the present is the effect of all the past operations of nature, and is the past under a different form, nature being, so far as we know, intrinsically immutable*. Hence, the earliest known stages of the cosmic universe must be regarded as the

causes of its immediate successive stages, and these of what followed, down to the origin of man and of modern civilization; and as inferior animals preceded man, they must be regarded as the cause of man's existence; and as plants preceded animals, they are the cause of animals; and incandescent nebulæ being the first of all, so far as we know, must be regarded as the cause of all.

The fundamental support of evolution is found in the accepted notion of the method of determining specific natural causes. If we do not know specific causes irrespective of their effects and judge of them only by their effects, and if, in turn, we do not know effects, *as effects*, irrespective of their causes, and if we know them as effects of certain phenomena only because we know them as uniform subsequents of said phenomena, the conclusion is logically necessary that within the sphere of uniform phenomena the theory of evolution is true. How far this uniformity extends now remains to be determined, and if no exception can be proved evolution is inviolable; and this is what we propose to show.

CHAPTER III.

THE SUPERSTRUCTURE.

§ 1. UNITY OF BODY AND MIND.

THE theory has a powerful support in the unity of body and mind in consciousness through all its modal changes. The multiplicity of phenomena, internal and external, are reduced to unity in the individual consciousness. Consciousness knows nothing of a dualism of natural forces. The entire organism in its complete and normal state is considered as a unit with the soul or conscious ego. The admitted difference is only phenomenal, while the unity is admitted to be substantive and individual. As the organism is indisputably derived from the extra-organic material world, this world is hence identified with the organism, and thence with the mind, since consciousness identifies the organism with the mind, at least in sensation.

§ 2. CORRELATION OF FORCES.

The theory of evolution is also favored by the law of correlation and equivalence of forces. Observation

teaches not only that motion generates heat, and that heat in turn generates motion, but that food generates animal strength, while the latter is, in turn, expended in raising, eating, and assimilating the food. We see, also, that this food affects the blood and brain, and that certain conditions of these, consequent on bodily action or some physical connection through the stomach or otherwise, are connected with certain forms of thought and feeling, and this thought and feeling are again a force which operates in modifying the blood and brain. All known unconscious things generate thought and feeling, and the latter in turn generate various unconscious things by operation on and through the organs of the body. The circle is complete and perfect. Mind and matter appear and disappear into each other. Deny correlation between mind and body and we must deny it everywhere.

In his lectures on positivism, Dr. McCosh confesses that this is true so far as our observation extends; but then, he claims, it may be different in another world! So it *may*, *if* there is another world; and *if* there is another world, it *may not*. But whether there is another world, and whether it is different from this, we are not as philosophers yet supposed to know, and to assume it all is to beg the whole question. He says: "As man is at present constituted the mind needs the physical force, and the brain-case to hold that force and direct it; but this does not show that in another state of things the mind might not without the body—and on other

conditions being supplied—think and feel and act as it did before.” To escape the force of a scientific induction he rushes out of the world. Science does not in such a connection presume to say what is possible or probable in another state of things. The Doctor’s logico-theological position may be true; but it is entirely transcendental. Our subject and discussion do not presuppose a “God” and “another state of existence” and a “compound nature,” and the opponent of correlation has no right to assume them in an argument against evolution. “Man as at present constituted and the world as it is,” is the object of our present pursuit; and finding that this man and world are correlated, just as the unconscious forces are correlated, with each other, science is content with the simple statement or the formulation of the facts, instead of rejecting or perverting the facts in deference to some speculations on (as yet) an unknown and unimaginable economy.

§ 3. ADVANCEMENT IN THE ORDERS OF EXISTENCE.

Evolution accords with the known process of advancement in the orders of existence. Hugh Miller states this point as follows: “There is geologic evidence, as has been shown, that in the course of creation the higher orders succeeded the lower.” “The fishès seem most certainly to have preceded the reptile and the bird; the reptile and the bird to have preceded the mammiferous quadruped; and the

mammiferous quadruped to have preceded man.” “The brain which bears an average proportion to the spinal cord of not more than two to one came first—it is the brain of the fish; that which bears to the spinal cord an average of two and a half to one succeeded it—it is the brain of the reptile; then came the brain averaging as three to one—it is the brain of the bird; next in succession came the brain that averages as four to one—it is that of the mammal; and last of all there appeared a brain that averages as twenty-three to one—reasoning, calculating man had come upon the scene.” These facts are equally coincident with the theory of a natural cause or of a supernatural cause. But then if they are explicable by the former, it must philosophically take precedence of the latter; and if evolution has other positive supports this coincidence becomes a collateral support. On the other hand, if creationism has no positive support this possible coincidence with the theory gives no support to the theory.

§ 4. EVOLUTION OF THE FŒTAL BRAIN.

There is an admitted order of natural evolution in the foetal brain. Miller shall be our authority here also, because he is a supernaturalist of the most pronounced type. He says: “There is certainly something very extraordinary in that foetal progress of the human brain. *Nature*, in constructing this curious organ, first lays down a grooved cord, as the

carpenter lays down the keel of his vessel ; and on this narrow base the perfect brain, as month after month passes by, is gradually built up, like the vessel from the keel. First it grows up into a brain closely resembling that of a fish ; a few additions more convert it into a brain undistinguishable from that of the reptile ; a few additions more impart to it the perfect appearance of the brain of a bird ; it then *develops* into a brain exceedingly like that of mammiferous quadruped ; and, finally, expanding atop, and spreading out its deeply corrugated lobes, till they project widely over the base, it assumes its unique character." Though this is a process of foetal development only, yet it is a case of natural evolution ; and as it forms a striking parallel with geological history, it furnishes, in coincidence with other arguments, a sound and powerful analogical argument in favor of the natural evolution of the successive orders of animals in the geological history.

§ 5. EVOLUTION OF THE PHYSICAL WORLD.

Evolution is exemplified in the physical history of the world. This is now no longer disputed. As early as 1848, Hugh Miller used the following language :

The geological "record does seem to speak of *development and progression* ;—not, however, in the province of organized existence, but in that of insensate matter, subject to the purely *chemical laws*.

It is in the style and character of *the dwelling-place* that gradual improvement seems to have taken place." Now the geological changes in this dwelling-place have been great and marvellous, surpassing in these respects all the alleged miracles of the Bible. To say that these changes took place in obedience to "*chemical laws*," only suggests the idea that the changes in the vital phenomena have the same origin. The latter supposition is the theory of evolution, and it is one that cannot be disproved; and if it could not be proved, yet, being the smallest possible, it is the preferable supposition. The extreme orthodox correspondent of the Scottish Press who wrote against Miller was as philosophical as his opponent when he was disposed to reverse Miller's doctrine, saying: "I confess myself to be one of those who not only cannot see any great difference between merely *physical* and *organic* development, but would be inclined to allow the latter (absurd as it is) the advantage in point of likelihood." If we accept or reject development of either the physical or vital geological phenomena, there are equal reasons for accepting or rejecting the other also.

§ 6. ISOMERISM.

There appears a distant intimation of evolution in the facts of isomerism and allotropism. We hence learn that even simple bodies are not fixed and immutable, that they change in the laboratory of nature without chemical combination; while other

facts go to show that the chemical power of all the simple elements is probably lost at a very high degree of temperature. In agreement with this the spectroscope reveals only two elements in some of the nebulæ, and this suggests the idea that all the others are evolutionary products of these, and that these also may be evolved from the imponderable agents, which are admitted to be correlative forces.

§ 7. THE DENIAL OF EVOLUTION INVOLVES THE PERPETUAL ANNIHILATION AND CREATION OF ALL THINGS.

The contrary correlative of the theory of evolution is inadmissible. The theory of evolution is that force is unchanged, that it evolves, by necessity of nature, new forms only, and that these constitute all known changes, so that we have a unity of force under a variety of phenomena. To deny evolution is to deny the conservation and unity of force, and to affirm that all new phenomena, instead of being a previously known force under a new form, are new forces or effects or signs of new forces, so that we have a perpetual beginning and annihilation of forces corresponding with the beginning and ending of phenomena. This is too absurd to be admitted; and so we are thrown back upon the conservation of force, its permanent existence under different modes which it evolves according to law. Nature is therefore a constant force which evolves in constant order new phenomena.

CHAPTER IV.

NATURALISM AND SUPERNATURALISM.

§ 1. HOW SUPERNATURALISM MUST BE SUPPORTED AND PROVED.

IT is inquired whether it is not possible for a Supernatural Power to operate nature and determine its phenomena? Allowing the logical possibility of this, it necessitates another question: How may we know that the supposition is true? We may not assume the operation of such a power without evidence. If we can legitimately make nature explain all phenomena, we are bound to do so and to exclude all contrary assumptions, because this is the simplest explanation, and, being all that is necessary, it is all we are justly entitled to affirm.

This Supernatural Operator of nature can be known only through an action which differs in its phenomenal effects from natural phenomena, that is, by its clearly irregular and miraculous character.

§ 2. KNOWN SUPERNATURAL OPERATIONS NECESSARILY VERY LIMITED.

But such phenomena must be very limited in extent. For if they were universal and uniform

they could not be discriminated from nature and must be accounted nature. If they were universal and irregular, existence would be impossible ; and, besides, we know that this is not true, and that phenomena are uniform. If this miraculous action is limited, then evolution still remains undisturbed elsewhere, that is, where there is no miracle ; for evolution is simply the operation of natural force minus supernatural force. Let it be conceded then, that evolution is the law of the universe, except where it is interrupted by miracle. Evolution is then nearly universal, for miraculous operations are necessarily and confessedly very limited.

§ 3. NOT KNOWN IN THE TRANSMUTATION OF FOOD
INTO THOUGHT.

This proves the correlation and equivalence of mind and matter in relation to food ; for no one pretends that there is any miracle in the process of the transmutation of food into thought and feeling, and of these again into food and other material forms.

§ 4. NOR IN BODILY GENERATION.

It supports the doctrine of the transmission of life, soul, and mind by natural law, or an order of natural force ; for propagation in plants, animals, and men, following a natural law, precludes miracle.

§ 5. NOR IN THE BEGINNING OF LIFE AT THE FIRST.

It proves the *possibility* of the natural evolution of life from unconscious matter; because, as there can be, or need be supposed, only one beginning of *all* life, there can be no law of such events, and therefore no miracle. While the leap from physical to vital is a variation from all other processes of nature, it does not follow that it is miraculous. It is merely to say that nature has done this only once. But many of her admitted achievements have never been repeated, so far as we know. She has never repeated the great geological periods in the physical evolution of the earth. We see at once that it would be contrary to the laws of nature to have them repeated. The same may be true of the beginning of life. The contrary or miraculous supposition requires positive proof, and this is impossible to be furnished. If we were familiar with many beginnings of life following the same laws, we should say they were natural, but it may be none the less natural because it occurs only once; and it cannot be miraculous, because it is not a deviation from many others of the same class, since there is no other.

The proof of spontaneous generation would end the controversy; but such proof is not necessary. It is enough that some past conditions *may have* originated both life and seed by a natural process.

Possibility of natural causation is all that science requires in support of evolution.

§ 6. NOR IN THE PROGRESSIVE RISE OF SPECIES.

Finally, the admission, which no one can withhold, that where there is no miracle, natural force or evolution obtains, proves the *possibility* of the evolution of species up to man, and inclusive of man, from the lowest forms of life. The leap from one species to another would be necessary only once, and the conditions which effected it would, it is supposable, pass away with the event. In this supposition there is no miracle, no contradiction of natural law, because we do not certainly know, from observation, a series of beginnings of species which constitutes a law in opposition to this supposition, and proving this, by its deviation, to be miraculous.

To ask for a specimen of such transition betrays a misapprehension of the subject. The theory of Darwin is not put forth as a fact known to the senses, else it would not be a theory, but as an idea which contains a possible solution or a theoretical solution of known fact; and if it is logically possible, it is to be preferred to separate creationism because infinitely simpler. If he cannot show a single indisputable exemplification of his theory, neither can the creationist show a single indisputable example of the miraculous creation of a species. Here both parties are on a level. Both know species, living and

fossil, various and numerous. One party dogmatically affirms without any proof that they were miraculously created as distinct species. The other, more modest and scientific, affirms nothing, but endeavors to find a solution of known facts in accordance with the fundamental law of science, the law of natural causation. If such a solution is logically possible, as a theory, which we have just proved, then it rises at once into a probability infinitely superior to creationism, because it assumes nothing, while the assumption of creationism is of an infinite magnitude.

§ 7. SUPERNATURAL POWER MAY POSSIBLY LIMIT
EVOLUTION.

In addition to evolution in natural causation, called second causes, there may possibly be a first Cause or Creator of natural force, and Initiator of its specific organic force. Absolute evolution, which makes nature the only God, cannot, of course, be true if the supernaturalistic conceptions of Christianity are true. Evolution must therefore be modified or limited at some point so as to make it compatible with them. Where shall this point be fixed? Let us see if any such point can be found.

§ 8. HOW ONLY WE MAY PROVE THAT IT DOES.

The central question is, whether there is any other power than that of nature; and if so, what

are the proofs of its operation? Of course, this other power must be supernatural. Natural force or power we know, and we know it as operating in regular and uniform order in producing effects, which in their turn become causes. It is not the regular order or uniformity which constitutes the cause; but the intrinsic and essentially immutable force as cause constitutes and creates the regular order of succession. Every new phenomenon is considered as an effect; and it is pronounced to be the effect of an antecedent which it uniformly follows; and science has no other method of determining the relation of cause and effect except by determining the relation of uniform antecedence and consequence. We repeat that it is not the temporal relation which is the cause (as has been often asserted), but the intrinsic force of the antecedent substance or phenomenon; though it must be in some special and temporal relation with that on which it operates; and what it is that operates this or that can be determined only by the uniformity of these temporal and special relations between the occurrences.

§ 9. THE TEST PRINCIPLE ON THIS POINT.

Natural force, not being arbitrary, operates uniformly, because, as it operates necessarily in virtue of what it is, it must in the same connections always operate the same. Hence supernatural power can be discriminated from natural force only by a different

mode of action ; that is, by a deviation from the regular order. Though we cannot deny that supernatural power *may* operate uniformly, yet we cannot know that any such operation is supernatural ; and as we know that there is a natural force which does operate uniformly, we are obliged, without further evidence, to assume that all such operation is natural—at least till we have once proved that there is a supernatural force. *Our starting principle, therefore, is that evolution or natural force operates wherever there is no evident deviation from the known course of nature.*

§ 10. FROM ADAM TO US NATURAL EVOLUTION ONLY OPERATES.

Hence, since the creation of Adam or the first man, or during historic times, evolution or natural causation only has operated in the propagation of the race, and souls as well as bodies, if there is any difference, have been transmitted or evolved, not only according to natural law, but, therefore, as the product of natural force.

§ 11. AND BODY AND MIND MUST BE PRONOUNCED ONE SUBSTANCE.

Hence, as there is a uniform correlation between mind or thought and matter, so that they are regularly transmuted into each other so far as we can

see, they must be inferred to be mutual causes to each other and to be substantively one.

§ 12. HENCE MIRACLES MUST BE REJECTED.

Hence, the alleged miraculous characters of the Bible and all others must be pronounced to be the natural products of their antecedents, because the force of the antecedents is known only by its subsequents considered as effects, so that we cannot anticipate them and say before all experience what they are competent to produce.

Hence, since the establishment of nature's order, all testimony to miracles must be accounted fabulous, because external nature is known to be uniform; while man's uniform nature is one of moral and mental infirmity, so that some of the ablest and best of religious men have been deceived, and have winked at fabrication for the sake of the faith and practice they have advocated.

§ 13. WHENCE THE INFERENCE THAT MAN IS
EVOLVED FROM BRUTE.

Hence, as monkeys lived before men, there is nothing to forbid the inference that men have naturally evolved from them. This inference is much easier than the supposition of the supernatural creation of men. In the former case we infer only that the *known* force of nature has in virtue of peculiar

conditions here evolved a peculiar result—a very natural, and the very smallest possible, inference or assumption, call it which you will. In the latter case we infer a power of whose existence we have as yet no knowledge or proof, and a power infinitely greater than the case calls for, and of a kind* different from the result, which is a being of natural powers or properties, while the assumed cause is supernatural. The latter has no collateral support from geology, while the former has. The merely physical transmutations of the earth in its geological history are admitted to be by natural evolution, though each great change occurs only once, just as the change from mere animal to man occurs only once.

§ 14. THAT LIFE HAD A NATURAL ORIGIN ONLY.

This argument is equally good for the successive evolution of all other species, and of life itself in its first form, whatever it was.

§ 15. AND THAT NATURE IS ETERNAL AND SELF-SUFFICIENT.

And finally, as nature is an intrinsic force, the kind and extent of which is unknown except from experience, there is not the slightest reason for inferring that it had an Author or beginning, or that it is not absolutely self-sufficient.

Thus we see that in nature there is no halfway house where supernaturalism may put up and rest—no point where we can say, here naturalism ends, and supernaturalism begins, nor is supernatural power anywhere clearly manifest. Admit a known natural force, we are logically carried back to the *nebulæ*. Absolute evolution must be accepted as a whole, or a new method of treating the subject must be invented.

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CHAPTER V.

PHILOSOPHICAL INCONSISTENCIES OF EVOLUTION-
ISTS AND THEIR OPPONENTS.

§ 1. SUICIDAL DENIAL OF CAUSE.

WE have in the Preface rebuked supernaturalists for not better understanding evolution before they attacked it; but we also owe them the acknowledgment that they have a very good excuse in the fact that evolutionists have only partially understood their own process, and they have, in consequence, often given a fundamentally false account of it. The argument, as we have given it, has never been given before in logical consistency. Evolutionists have meant just what we have said; but they have not seen it with sufficient clearness to say it without also saying other things which damaged or nullified it. Their metaphysics has been false and in diametrical opposition to their theory. This is the natural result of the metaphysical ignorance and incapacity which expresses and vents itself so frequently in decrying metaphysics.

Hence they have not known that the immediate knowledge of veritable force and causation in nature

is the foundation and corner-stone of evolution; and in strange and blind stultification of their doctrine, they have steadily denied the knowledge of causes, and affirmed that our knowledge is confined to co-existent and successive phenomena, relegating cause to metaphysics, and metaphysics to savages or to barbarians. Against the praise that the disciples or admirers of M. Comte award to him of banishing the study and pursuit and supposed knowledge of cause from science, and making phenomena and their temporal and special relations to be the only objects of knowledge and scientific research, Huxley very justly reclaims that honor for David Hume; whose doctrine, that cause is nothing but a name that we give to an inability which we find in our minds to dissociate two ideas which have always followed each other in our past experiences, Huxley extols as one of the highest proofs and products of metaphysical genius the world has ever contemplated.

§ 2. INCONSISTENT AFFIRMATION OF THE KNOWLEDGE
OF CAUSE.

On the other hand, physical science since the time of Mayer, or for the last thirty years and upwards, has been advancing, to the utter abandonment of this metaphysical figment of Hume; and what is very strange, when his great abilities are considered, Dr. Huxley has appropriated this new idea of physical force, and has been standing on it all through his

intellectual life; and yet has never seen that it is in flat contradiction to his metaphysics derived from Hume, and that these metaphysics are in flat contradiction to his doctrine of evolution, which in every part implies the correlation and equivalence of *forces* or the conservation of *energy*. Without force or energy undestroyed and undiminished but only changed in combinations and forms, there is no evolution. In all experience and all phenomena we are immediately conversant with force, with natural force, which is uniform in its operation. On this simple fact our argument has been constructed. Disprove this supposed fact and bring back the doctrine of Hume and M. Comte, and my argument for evolution falls. And there is no other argument. All arguments logically suppose this, though they may nominally deny it.

§ 3. TWO POINTS CONFOUNDED UNIVERSALLY AND
DISASTROUSLY.

On the subject of cause there has been a universal and disastrously blinding confusion of two points which are entirely distinct—Do we know causes; and how must we discriminate between different causes? These two have been treated as if they were one. The truth is this: We know cause as the operation of force in all known things or phenomena. We cannot have an experience except as the experience of some force operating on us, that is,

as a cause. Thus we know everything as cause ; but for this very reason everything is also an effect, because everything is operated on by something. Now if we want to determine *the cause of any given effect*, this is a very different inquiry from the inquiry *whether it has a cause*. An assumption of an affirmative answer to the latter is contained in the former.

Now it is because we determine specific cause or discriminate the cause of one thing from what is not the cause of *that* thing (but of some other), by the law or rule of uniform antecedence and subsequence, that it has been blindly supposed by that acute metaphysician above-mentioned, in which he has had too large a following, that this temporal connection constitutes our only notion of cause ; and thus the basal intuition which gives to this inquiry all its significance is dissipated, and the inquiry itself turned into a contradiction or a mere verbalism.

We repeat that *all nature is a cause or force in operation*, that *its operation is uniform because its force is unchanged* ; that *the kind and degree of this force are known from experience, and from experience only, so that it cannot be anticipated*, and *we are never warranted in saying of any phenomena which nature presents that she was incompetent to their production*. On this foundation evolution is impregnable, and on no other is it tenable, and this foundation we think is indestructible.

Is it not singular that Huxley and others of his

standing should unite with the enemies of evolution in affirming our ignorance of material force?

§ 4. FERNAND PAPILLON ON IMITATION AGAINST
EVOLUTION.

This argument, indeed, based on the intrinsic forcefulness of all things, nullifies all possible objections drawn from natural phenomena or all phenomena that are not indisputably known to be supernatural. A French writer, Fernand Papillon, says that while the faculty of imitation "may and does act in concert with hereditary impulsions, it far more frequently works independently and even in a direction counter to them." But he gives no clear instance of this, for the "sufficient reason" that nothing *can* be shown to be contrary to heredity. An operation may be known to be in opposition to *some* inherited forms and forces; but it cannot be known that there were *no forces* in all the past as the cause of the present operation, whether in the faculty of imitation or other faculties. That causes are occult is no proof that they are not natural but supernatural; and till the occult cause is revealed directly as a supernatural cause, evolution stands good.

§ 5. HIS ARGUMENT FROM VOLITIONAL SPONTANEITY.

The same gentleman also says: "The individual personality of the soul, which is preëminently the

instrument of free inventiveness and the unfailing spring of the innovative faculty, might, *in contrast with heredity*, be called spontaneity." We allow of an individual personality, so far as we know what that phrase means, and we allow that in some directions it is an innovative faculty and inventive, and that it produces what otherwise would not be; but in all this there is no proof that the individual personality and all its actions are not the products of precedent natural forces. All induction goes to prove that they are, and there is nothing on the other side. Causes are known only as some antecedent phenomena, so that it is a contradiction in terms to admit this, and then to assert that we know causes which are not antecedent phenomena; and then to deny that this is the only way of determining causes is to abandon the ground of scientific discussion.

§ 6. INCONSISTENCY OF THOSE WHO DENY NATURAL
FORCE IN OPPOSITION TO EVOLUTION.

Dr. Winchell explicitly abandons this method of resisting the arguments in favor of evolution. He first pleads a variety of facts to mask his approach to his real defences. Among other things of like kind he says, that there were very exalted organisms, the trilobites for instance, in the period of the first fauna, when it is supposed they could have no chance for natural evolution; that the length of the legs and neck of the giraffe, the transition of the fish to an air-

breathing animal, the procuring with different organs the same food by man and monkey, the stability of species under very various influences of climate and situation, and the diversity of species under the same circumstances and situation are irreconcilable with evolution. We leave these and other such things for physicists to answer, which they will consider no difficult task. For ourselves we consider only the PRINCIPLE. If we are not able to give a satisfactory evidence of the natural antecedents and cause of some phenomena, we are not disturbed by this; for the logical validity of evolution is not at all affected by this. We can turn the tables on our opponents and challenge them to show the connection of these same phenomena with a supernatural cause. This they cannot do. Their *supernatural cause is only inferred, and that on the basis of a principle which does not belong to natural science*, a principle which they cannot themselves philosophically expound, much less justify, *a principle in respect to the philosophy of which supernaturalists differ among themselves, and which many of them entirely repudiate, the principle that matter is devoid of force, so that the law of uniformity proves nothing of causes*. But they all act on the *contrary* of this principle when their mental vision is not deflected by their opposition to a new discovery of science. They allow that *there is force* in the murderous blow for which they advocate the penalty of death, in the food which sustains their life, in the plough that turns

the soil, in their words which strike the ear of their audience; and in all circumstantial evidence it is solely by the law of uniform antecedence that the investigation is pursued and the conclusion reached. By this principle and law the true scientist is guided; and according to this there is nothing which is impossible or improbable a priori; and therefore the true devotee of science always judges without prejudice (prejudgment), and his inferences are always the most modest and the most limited that he can make.

§ 7. PREJUDICE OR PREJUDGMENT.

The unscientific spirit of prejudice is manifested by some authors in such exclamations as "who can believe" or "it is impossible to conceive" that such effects have such a cause? Of course those who have an inability of this kind are to be tolerated with patience, though science and philosophy will appeal to them in vain. The secret of this inability Winchell announces in the latter portion of his book as follows: "Natural connections are not causes, but only conditions," and "natural selection is not a cause," and the only "cause is mind," whence it is easy to talk of "the incongruity between natural selection and the results attributed to it." (*This we shall notice anon.*)

If, then, we have proved that man and nature, mind and matter, are one, being correlated and equivalent forces, that here the law of evolution obtains

and operates; if we have proved that the same law operates everywhere in the law of natural propagation; and if next we have proved the *possibility* of the evolution of life from unconscious matter, and of all species from the lowest forms of life, we have proved everything that is thus far essential to the doctrine of a thorough naturalistic evolution.

CHAPTER VI.

CREATION, MIRACLES, AND A PERSONAL GOD.

§ 1. A SUPRA-NATURAL PERSONAL DEITY MUST BE
PROVED, NOT ASSUMED.

BUT we are logically compelled to go further. Not content with proving that evolution is the law of nature, and that it must therefore operate in nature, except where a supernatural Almighty interposes by miraculous agency, we must demand a proof whether there is any such agency anywhere, and whether there is any such Agent.

§ 2. NATURAL PHENOMENA CANNOT FURNISH THIS
PROOF.

The proof of such an Agent and operation must come either from natural or supernatural phenomena in the known cosmic world. It cannot come from natural phenomena, because they speak only of natural force; and so far as we can explain anything by natural force, we have no logical right to transcend nature, and the hypothesis of a personal Deity is unwarranted.

§ 3. NEITHER CAN IT BE FURNISHED BY SUPERNATURAL PHENOMENA.

The proof of the existence of a supernatural Being cannot come from supernatural phenomena interjected among natural phenomena, for two reasons. First, all miracles, real or pretended, presuppose the existence of God as a supernatural Being, and they are always presented as proofs that their visible agent is a messenger of God. They are never presented as proofs of the divine existence, but only as proofs of the veracity of a pretended mission or communication from God. This is always admitted by Theistic divines.

Second, the improbability of miracles is so great that they can never be reasonably admitted till we have a knowledge of an almighty supernatural Being. The existence of such a Being once known, miracles become possible and cease to be utterly improbable. But at the present stage of our investigation we have no such knowledge nor the first step toward a probable proof. We are as yet wholly and only in the phenomena of nature, and know nothing of the specific causes of any of these except their antecedent phenomena. Assuming a Supernatural Being and that we know His designs, it will be easy enough to find miracles as expressive of that design and as methods of promoting it. But science is not assumption; and we therefore set these faiths aside

till we get proof of their right to our credence, and we will use them when we can do it with philosophical legitimacy.

§ 4. MIRACLES IMPOSSIBLE SO FAR AS WE CAN EVER KNOW.

From this naturalistic position all phenomena must appear to be simply natural in contradistinction from supernatural and miraculous. On this ground miracles are justly and necessarily pronounced impossible, because it is impossible for them to be known and proved in discrimination from natural effects.

§ 5. MIRACLES AND SUPERNATURALISM RETIRING.

All along the ages the progress of knowledge has ever been busy in transmuting supposed supernatural and miraculous phenomena into natural phenomena; of which the last decisive and striking example in history is the destruction of witchcraft and the fairy world.

For nearly half a century geology has been the theatre of a contest between naturalism and supernaturalism; and in some important and definite points naturalism is now the undisputed victor, while it is as confident as ever that it will yet conquer the whole field. But a few years back supernatural catastrophism was the prevailing orthodox

explanation of the successive geological ages and progressions both physical and vital. But no man of science now holds this view concerning the physical geological progress. All admit a progress and that it was by natural process, so far as we can see, and a natural process is a process of "evolution." This was candidly confessed about a quarter of a century ago by Hugh Miller, the most brilliant antagonist of evolution when that theory was in its crude and incipient state, as presented by Maillet and Lamarck and the *Vestiges of Creation*.

§ 6. THEIR PRESENT FIGHTING AND CAMPING GROUND.

The geological stand for a supernatural creationism is now made on vital organisms. In support of this doctrine three arguments have been advanced. The first is the assumed separation of the different orders by the utter extinction of the lower before the higher came into existence. If this were true, it would, of course, be impossible for mollusks and crustacea to develop into fishes, and these into reptiles, and these again into birds and thence into mammals. But this has been abandoned for the obvious reasons that it was a negative position and could not be established, and because all the lower forms of life are now coexistent with the higher; so that there is every reason for believing that the lower have existed without cessation through all changes;

and minuter investigation into the geologic records confirms this.

§ 7. THEIR ARGUMENT FROM PERMANENT
DETERIORATION.

A second argument is derived from monstrosities and permanent deterioration of types. Hugh Miller makes much of this. But from our present standpoint nothing can be more logical or scientific than to turn these facts the other way. Permanent deterioration is permanent deviation from a previous type; and if nature under certain circumstance had power to deviate in one direction, it is reasonable to infer that she had power under other circumstance to deviate in another direction. (To some extent we find both deviations at the present time.) And this inference, being infinitely less than that of creationism, is to be infinitely preferred.

§ 8. FROM PRIMITIVE PERFECTION OF TYPE.

Allied with the argument from permanent deterioration there is the corresponding argument from the perfection of the type on its first appearance, which it is argued is contrary to what we should expect from it if it is a development from a lower order. This is the great and standard argument. On the preassumption of a Supernatural Deity this would have a degree of force as a probable argument. But as this alleged fact cannot be demonstrated to

be absolutely and logically incompatible with naturalism; and as naturalism is indisputably known while supernaturalism is not; and, further, as it is infinitely less to infer a natural than an infinite supernatural cause of said fact; and again, as we know no cause irrespective of its effect but only in temporal relation with succeeding phenomena; and, finally, as a natural cause is the uniform or therefore the *only* antecedent of the subsequent or effect, it follows that the inference of naturalism is here as everywhere infinitely less improbable or more probable than creationism. Besides, as a miracle is discriminated from nature only by its deviation from known law, there can be no evidence of miracle where there is no such law; and the unique phenomena or operations of force must be considered as natural; and thus the proof of creation is impossible.

§ 9. THE SENSES CANNOT RECOGNIZE A MIRACLE.

In a similar way the alleged miracles of the Bible are explained away with equal ease. From the supernatural theistic assumptions of the writers of the Bible, its miracles, including prophecies, are entirely appropriate. But we are logically compelled to examine these records *in the light of nature and of natural causation*; and in this light they assume an entirely different aspect. The natural antecedents of any alleged phenomena, or any known phenomena also, must be considered to be the cause;

and as all have some such antecedent, they must all be referred to some natural cause; that is, the possible or indisputable facts of our senses are to be explained as the effect of some known or possible antecedent, and *any conceivable natural antecedent as cause* is to be preferred to the assumption of a supernatural and miraculous cause.

§ 10. MUCH LESS CAN THE TESTIMONY OF OTHERS
PROVE A MIRACLE.

Hence, the historic credibility of any number of witnesses to a miracle is invalidated, because error, fanaticism, and imposture are consistent with the nature of man, and are natural possibilities and familiarly-known facts, as exemplified in characters of high intelligence and eminent moral worth, and the supposition that a person is guilty of one or all of these when he affirms what is known to be contrary to natural law, is far more reasonable than that his testimony is true. Again we repeat, that if Supernatural Theism were known to be true, testimony to miracles would not be so improbable *a priori*, especially if the alleged miracle sought a high moral and religious end; but the evolutionist has not attained to such knowledge—else he would not be an evolutionist; and against him it is in vain to argue on supernaturalistic principles. Either the fundamental principle of natural causation on which evolutionism is based must be refuted, or evolutionism must be refuted on its own basis.

§ 11. JESUS AND SOCRATES AS SUPERNATURAL
CHARACTERS.

It is claimed that Jesus is a miraculous character, because, in equally favorable natural connections, nature has nowhere else produced such a character. This is inconclusive, because we do not certainly know that there ever has been a case in which equally favorable natural connections have converged on the same parentage and birth. It is possible that Jesus is as much a product of His natural antecedents as Socrates was of his. Next to Jesus, Socrates is the most remarkable character of history.

We suppose it will be allowed that he was the natural product of his antecedents—his ancestry, country, and circumstances. If this be denied, the distinction between natural and supernatural action and phenomena is destroyed; for here it will not be claimed that there is any deviation from law or the exhibition of any miraculous force or power; and if the distinction is destroyed, there is nothing to contend for and the two parties become one. Evolutionists will be entirely willing to admit that in Jesus there is the same kind of force or power, whether natural or supernatural, that operates in the production and development of Socrates, as this is what evolutionists mean by natural force.

The natural is often wonderful and inexplicable. This is true of the character of Socrates, which

could never have been anticipated from his parentage and his early training, and there was nothing to prefigure it in his physique. All known antecedents seem to go against such results. Yet no one doubts that there was a law of natural causation between his antecedents and his wonderful powers and career, though we are not able minutely to trace that connection. No one takes him to be a miracle or a miraculous progeny. It is always assumed that in his origin and development there is no violation or suspension of or deviation from natural law. Yet his life and character are as marvellous relative to his antecedents as are the life and character of Jesus relative to his antecedents, if we except the alleged miracles of the latter, which are the chief point in debate. In neither case does our mere ignorance or our inability to explain the phenomena by natural causation in satisfactory connection, entitle us to infer a supernatural and miraculous origin of such phenomena; and if it is inferred in either it must be inferred in both in the same sense and degree. Both cases are extraordinary, and as the naturalistic explanation must consist in showing parallels, in which similar antecedents have been followed by similar consequents, no perfect verification in either case is possible; but a proximate verification is possible, and for one just as much as the other.

That they are extraordinary is no proof that they are not natural or the effects of natural causes, because we do not know the degree and kind of these

causes per se, or irrespective of their effects. We have never been able to say of any natural agent irrespective of all experience of the degree and kind of its force, that it is competent in such or such connections of operating thus and thus and only thus, and of producing such and such results and such only.

As we know causes only by the effects they have produced and by their antecedence to the subsequent, called the effect, we cannot take any class of phenomena before their effects in any case have been found from experience and make any affirmation or denial respecting the kind or extent of their power. We determine or judge of their force *only* by what follows them. We have therefore no right to say that the antecedents of Jesus were inadequate to the production of his character. On the contrary, we are bound to affirm in consonance with our principle that those antecedents are the cause of his character.

Neither are we entitled to affirm that his character and endowments are an example of a deviation from natural law because he was so different from all his Jewish contemporaries. Who does not see that his antecedents were different from those of all other men? and who can say that they were not as different as he? To answer this last question would require a supernatural knowledge both of him and of his antecedents. In the mean time the conclusion that He was their natural product is a logical necessity from our principle. In the light of this principle also all His alleged miracles may and must be reduced

to natural phenomena either of fact or of imagination. The stilling of the waves, for instance, must be interpreted as a natural coincidence with His words, which were probably a prayer. Any critical violence to the narratives of the evangelists is more reasonable than to receive their miraculous stories.

§ 12. CREATION AND DEVELOPMENT AS ALIKE
UNWITNESSED.

Against evolution Hugh Miller argues that "there can be no real escape from belief in *acts of creation never witnessed by man*, to processes of *development never witnessed by man*; seeing that a presumed *law* beyond the cognizance of experience must be as certainly rejected, on the principle of the argument, as a presumed *miracle* beyond that cognizance. It places the presumed *law* and the presumed *miracle* on exactly the same level." This passage exhibits a misapprehension of the point of vital importance in the debate, a misapprehension which creationism and miracleism has been constantly repeating from the time of Hume, beginning with his opponent Campbell. Miracle and law can never be on exactly the same level, because, though miracles were allowed to be possible and credible and cognizable, law must precede miracle and must be known before miracle is possible, since miracle is known or conceivable as miracle only by being an exercise of power that does not conform to law; and before we can know that

an event is miraculous we must know that it does not conform to an order of natural succession and causation. And this last we never can know, because, as every event must have some temporal connections, and as we know natural causes only as antecedents, we can never know that the antecedents of any phenomena are not their cause. We may know in many cases that some antecedents are not their cause, but never that no antecedents are the causes of their subsequents.

§ 13. ON A PRESUMED LAW AND A PRESUMED
MIRACLE BEYOND EXPERIENCE.

There is also a fallacy here involved in the comparison of the presumed law beyond experience, and the presumed miracle beyond experience. *All law* is not beyond experience. We are familiar with law. It enters into all our experience. Natural law is so obvious and so general that supernaturalists have absurdly endeavored to explain the miraculous in conformity with natural law. Natural law, then, is undisputed. But we cannot say this of miracle. Whether there is such a thing as a miracle is the point in dispute.

Now when we explain a class of phenomena by reference to presumed law, we only presume in this case what we *know* in reference to all other cases. But if we explain the phenomena by reference to a presumed miracle, we presume that of which we have

not *known* a single case; and we presume besides what is not logically necessary, and what is also the greatest possible assumption. The naturalistic inference is, therefore, not to be compared with the supernaturalistic inference in its presumptiveness. The former is the smallest possible, while the latter is the largest possible, assumption. Philosophy cannot therefore hesitate which to prefer. If supernaturalism cannot find some new foundation to stand on, it must philosophically succumb to naturalism. The former may possibly be true, and those who will may hold to it; but the latter is far the more probable, and receives the homage of philosophy, and must therefore largely control the intellect of the world.

§ 14. OUR ARGUMENT DIFFERS FROM THAT OF
HUME.

The argument which naturalism urges against miracles to-day is not borrowed from Hume. It is far more thorough and logical than his. He argued against the miracles of the Bible without denying the existence of a supernatural personal Deity. He could not, therefore, deny that God might work miracles; and that after laws of nature have been established, our senses under proper conditions might possibly recognize a miracle. But then he argues that after miracles have ceased, we could not transmit the historic proof of their occurrence, because

nature's constancy is more reliable than history or human testimony. This was met by the reply, that since on this argument miracles may have been real but are yet incredible, it is possible that nature's present uniformity compels us to believe a lie, and thus his argument stultifies its own authority and basis, nature. Scientific and philosophic naturalism now denies, not merely the historic credibility of miracles, but the possibility that any of our senses can be cognizant of their occurrence, or that miracles are in any way possible. It affirms that all possible known events must be considered as effects of some natural antecedents, because, as the cause is in no case supposed to be independently known, this inference is in degree infinitely less supposititious than supernaturalism, and because phenomenal antecedents we do know, and nothing else.

§ 15. NO PROOF OF THE BEGINNING OF NATURE'S
EXISTENCE.

If all proof of supernatural interposition is impossible, and if the proof of specific creations is impossible, how is it with the creation of the natural universe as a whole? It may be thought that this is of small consequence if evolution operates everywhere and always in the universe from the moment of its creation. Yet if we could find a supernatural Author of nature, we should have reason for seeing

the same Author at work supernaturally in connection with nature, and the question is therefore of great importance.

If the natural universe had a beginning, it will be allowed that it had a supernatural origin; for the contrary supposition is self-contradictory. But where is the proof that it had a beginning? So far we have come in contact with no facts or principles which go to prove such a beginning. If the natural universe is its own operator, and is thus sufficient to itself as seen in the idea of natural causation or the law of evolution, then the supposition of its beginning and of a supernatural Cause of it is logically precluded, because not logically necessary. Thus nature is all and in all, the absolute, the persistent force.

§ 16. NO PROOF OF DESIGN IN NATURE.

The philosophy of nature thus precludes all proof of *supernaturalism*. It repudiates design in nature and admits only unconscious force, till by the process of evolution this force evolves animal life. There is, therefore, no need of a Creator, or any extra-mundane Being, and the metaphysics associated with this theory denies that we have any notion of such a Being. Nature is pregnant with intelligence which evolves its indicators in the course of her operations; and so an unrevealed and inconceivable and intra-mundane intelligence is some-

times assumed and referred to. But this mysterious power is nothing apart from nature, and apart from the animal world is not self-conscious, personal, and purposeful, and is not therefore the absolute creator or originator of anything, unable to increase or diminish the sum of being, and is unable to alter the course of nature so as to vary the degrees and forms of pleasure or pain or of unconscious motion.

CHAPTER VII.

METHOD OF REFUTING EVOLUTION.

§ 1. THE TWO POSSIBLE METHODS

WE now inquire how evolution is to be confuted? We shall find that this can be done only by the enforcement of some argument new to theological discussion. Evolution has swallowed up all the old and standard arguments of Theism, as the rod-serpent of Moses devoured those of the Egyptian magicians. We may attempt the overthrow of evolution either by assailing its fundamental principle, or by an attempt to prove facts which are incompatible with evolution.

The fundamental principle of evolution is the law of natural causation. This law can no longer be disputed. There is such a thing as natural force and natural causation, and all natural forces or causes are known only by their effects, and their effects are known only as their uniform subsequents. From this follows, as we have seen, inevitably, all the essential conclusions of evolution. Evolution must therefore stand, unless we can rebut it by other principles and facts equally indisputable and of paramount authority.

§ 2. APPEAL TO OUR MORAL NATURE FUTILE
AGAINST EVOLUTION.

This has been attempted by an appeal to our moral nature. This appeal is illogical except on the supposition that our moral nature is supernatural. Those, therefore, who subject our volitions to a law of necessity and uniformity derived from our nature and circumstances, shut themselves out from the right to use this argument; for according to them all moral action is by natural evolution, and if our moral nature exemplifies evolution it cannot disprove it anywhere.

On the other hand, it is a contradiction in terms to affirm that our moral *nature*, or any other *nature*, is supernatural. All appeal, then, to our moral *nature* against evolution, must be abandoned as suicidal.

If there is anything in our moral powers and judgments which is surely supernatural, and if this supernatural is clearly incompatible with evolution, it will confute and supersede evolution so far as this incompatibility extends. But where is this supernatural moral element? The assertion of it is of no force against those who declare that they are unconscious of it; and these, to say the least, are vastly in the majority in the ranks of both philosophy and science as well as in theology. Besides, if the phenomena of moral judgment and action can possibly be explained by natural causation, this is to be pre-

ferred to the supernatural as infinitely the more reasonable and philosophical. This possibility is demonstrated in the simple consideration that it is not logically impossible, does not involve a self-contradiction, and by the observed facts that all moral activities (both in men and animals) have regular antecedents and subsequents, showing, as far as we can see, that they belong to the chain of natural causation; and by the further facts that a feeling of responsibility, of guilt, of shame and moral pride, and other cognate feelings, belong to brutes, especially to apes and dogs, which are supposed to be wholly natural, not supernatural.

§ 3. FUTILITY OF TELEOLOGY AGAINST EVOLUTION.

Teleology, or the argument from supposed marks of design in nature, is another standard method of supporting supernaturalism. The wondrous adaptation of means to ends, the evident existence of what are called "Typical Forms," it is supposed, prove a supernatural designing and controlling mind. That these facts prove the working of mind no evolutionist will care to deny, since he makes mind and matter one; but he will justly deny that they prove a supernatural mind. These facts are found in the connections of nature, and nature is all that we see, and we have no particle of a proof that their natural antecedents are not their natural causes.

To this supernaturalism replies that those natural

antecedents are not *adequate* causes of such results. This reply assumes what no man of science, what no philosopher will admit, that we know natural causes irrespective of their natural connections and effects, and are thence able to judge and determine without experience and against experience the kind and degree of their force. This is contrary to the admitted notion of the method of determining natural cause as uniform antecedent.

The evolutionist therefore replies: We see these supposed teleological phenomena regularly following other natural phenomena, and we have no alternative but to accept here as everywhere the naturalistic and scientific doctrine that the uniform subsequent is the effect of the uniform antecedent. All other cause and effect is beyond our knowledge; and we see not the slightest reason for assuming, or supposing any other, even if any other were conceivable. Since natural causes are known only by their uniform subsequents, their "adequateness" is known only in the same way, so that it is utterly unphilosophical to judge of their adequateness by any other means, or to suppose for regular phenomena a cause that transcends all phenomena.

§ 4. FEELING OF DEPENDENCE NO ARGUMENT
AGAINST EVOLUTION.

Mr. Mansel surrenders all other arguments except "the feeling of dependence." It is singular

that so sharp a mind did not see the folly of this. This is one of the points urged by Büchner on the other side. We are utterly dependent, the latter justly says, on nature for all that we know and are. This dependence on nature is implied in the theory of evolution, since nature is the known source of all things. As the *feeling* of dependence does not tell us that we are dependent on the supernatural, and as we know, so far as we know anything, that we are dependent on nature, we have not the slightest reason for referring this feeling to anything else than nature.

§ 5. SCRIPTURE HERE WITHOUT AUTHORITY.

There remains to us nothing but Scripture for the confutation of evolution. But this is based on the supernatural, which remains yet to be proved. The evolutionist claims that the Bible and all religious thought are the natural effects of natural evolution; and the Biblicist has nothing with which to rebut the claim, and to quote Bible against the evolutionist will appear to the latter like an attempt to pull a tree up by the roots while we stand on one of its branches, or rather for one of the branches to pull up the tree.

CHAPTER VIII.

DAWSON'S REFUTATION OF EVOLUTION.

§ 1. DAWSON'S STYLE AND PHILOSOPHICAL
INCOMPREHENSION.

WE believe that the foregoing chapters comprehend in substance everything that can be said for or against evolution. But as the same essential arguments have a fresh and peculiar force imparted to them by every individual writer, so that they are supposed to be something new or additional, it will be well, at the risk of some repetition, to review the efforts of some of the more recent and able opponents of evolution.

We take Vice-Principal Dawson, of Canada, first. Dr. Dawson's *Story of the Earth and Man* is equally interesting and valuable, combining the researches of science and the charms of literature. But his style when discussing the doctrine of evolution is unworthy of science; a dogmatic spirit and a dogmatic result being its chief inspirer and end. It is too much in the vein of those popular religious diatribes which refute evolution by referring its origin to that depravity of heart which seeks to get out of

the sight and dominion of God. Though it does not say this, its tone is censorious and inculpatory. Dawson ranks well in physical science; but, as we have seen, the debated questions on the subject of evolution are all metaphysical; and a brief examination of his two chapters on evolution will show, that whatever his knowledge of the physical phenomena involved in the discussion, he does not comprehend the philosophy of the subject.

§ 2. NOTHING FORTUITOUS OR INSIGNIFICANT.

This is manifest at the outset (p. 318), where he says that the evolutionist "approaches nature as he would a chaos of fallen rocks, which may present forms of castles and grotesque profiles of men and animals, but they *are all fortuitous and without significance.*" This is not true. To the evolutionist there is nothing "*fortuitous*," because everything is what it is by force of nature's operations, all of which are uniform and invariable, so that fortuitousness is an impossibility. Neither are they "*without significance*," because they always signify something respecting some antecedents and subsequents, if not consequents.

§ 3. HIS MISCONCEPTION OF THE FOUNDATION OF EVOLUTION.

On page 322 he begins to show the successive assumptions which he alleges constitute the founda-

tions of evolution, precluding this with some assertions as to what does not constitute its foundation. Here he says evolution does "not rest, like the deductions of theoretical geology, *on the extension into past time of causes of change now seen to be in action.*" This must be met by an explicit and unreserved contradiction. This is just what evolution does rest on, and on nothing else. It sees the operation in nature of natural cause now, and it sees nothing else either now or in the phenomena of geology, and it infers nothing more as the cause of all that it knows or does not know; *so that evolution is simply the known in nature extended over all the unknown.*

§ 4. EVOLUTION DOES NOT ASSUME THE EXISTENCE
OF FORCE.

"In the first place," Dawson says, "we are required, as evolutionists, to *assume* certain forces or materials or both with which evolution shall begin." (P. 322.) He then details the forces and materials assumed by different parties. This is another error respecting the evolutionist's procedure. The forces and materials are given or furnished to us in experience. Whatever is known or can be known is a force, for nothing can be known except as a force; so that forces and materials are *known*, not assumed, or merely believed, if anything is known. If any one questions whether *all* known things are forces, none can question that whatever causes motion and change

is a force; and as we are conscious or observant of changes and motions we know that there are operating forces. Dr. Dawson finally concedes with a generous air that there are forces and materials, and so this so-called *assumption* of the evolutionist may be allowed to pass as a knowledge.

§ 5. NOR THE UNITY OF FORCES.

“Being granted thus much, the evolutionist next proceeds to demand that we shall believe in the indefinite variability of material things, and shall set aside all idea that there is any difference in kind between the *different substances which we know*. They must all be mutually convertible, or at least derivable from some primitive materials.” (Pp. 323, 324.) Observe here that he admits that “we *know*” “different substances” or materials which he had just charged the evolutionist with gratuitously *assuming* and demanding *belief* for. Observe next the erroneous statement that evolution assumes as one of its basal principles that all substances are “mutually convertible or at least derivable from some primitive material.” This is only one of the many known facts forming the inductive argument in support of evolution; and it is one of the least significant points, and as such we have given it. It is never assumed as a basal principle of the doctrine, nor is it at all essential to the doctrine. The revelations of the spectroscope and other facts seem to favor the notion

of such evolution of the different known substances, and evolution uses this, but does not in any degree depend upon it. Evolution would be carried far enough to trouble such men as Dawson if it went no farther back than to the simple substances and forces which our chemistry has not been able to dissolve. To carry it a step farther might be gratifying to science; but that would not affect the philosophical or theological character of evolution.

§ 6. INDEFINITE VARIABILITY OF FORCES.

There is also an erroneous implication contained in the assertion that "the evolutionist next proceeds to demand that we shall also *believe* in the *indefinite* variability of material things." Does Dr. Dawson know exactly all the degrees and kinds and forms of variability possible to material things? If he does, let him enlighten the world, for he is the only man who does know all this. In the meanwhile, as we *know* that there is *some* variability of material things, and even marvellously great variability, their variability is to us indefinitely great, and this is not a mere *belief*, but a *knowledge*. We have no data for assigning any limit to this variability, and inductive inference, so far as it has any force here at all, favors the assumption of an unlimited variability, though evolution does not positively make this inference, and does not need it; least of all does it assume it as fundamental.

§ 7. FORCES DO NOT OPERATE IN ONE DIRECTION ONLY.

Dr. Dawson proceeds: "But if we grant this second demand, the evolutionist has a third in store for us. We must also admit that by some inevitable necessity the changes of things must in the main take place in one direction, from the more simple to the more complex, from the lower to the higher." On this we observe that his qualification "in the main" is judiciously inserted, as it is sufficiently vague or elastic to cover as much or as little as may suit the convenience of its author, so that we cannot so definitely refute this passage as we have the others. His additions, however, will help us. He adds that there are counter-processes always going on, so that the totality of phenomena presents us with "a revolution," instead of a simple evolution. This is obvious and admitted by Spencer, and it is included in the complete doctrine of evolution, though this term is most frequently used with an eye chiefly or wholly to the process from the simple or homogeneous to the complex or heterogeneous, instead of to the totality of the two-counter processes; and this more neglected side we shall elucidate a little before we close. Evolution proper is always "in one direction," from the more simple to the more complex; while involution, which is always going on, is just the opposite, and the two processes

are complementary. Neither of these are "assumptions," or "postulates," mere "demands" on our faith, but observed and known facts; and the only question that can be raised is, what these processes achieve conjointly, and how far can we trace back the process of evolution by observation and legitimate induction?

§ 8. ON FILLING THE GAP BETWEEN DEAD AND
LIVING MATTER.

Dawson continues: "If, however, we grant the evolutionist these *postulates* (?), we must next allow him to take the facts of botany and zoology out of their ordinary connection, and thread them like a string of beads—on the threefold cord thus furnished. This done, we next *find*, as might have been expected, certain *gaps or breaks* which require to be cunningly filled with artificial material." "The first of these gaps which we notice is that between dead and living matter." We are not disposed to disparage the discoveries of Dr. Dawson and his friends; but we should like to know where they *find* any gaps or breaks between dead and living matter; and then why they require to be filled up cunningly or otherwise, and with artificial material or any other material? In order to argue on this subject, it is necessary to have some notion as to what this gap is. But neither Dr. Dawson nor any of his party have ever stopped to consider this question, and

have never given to it the slightest attention so far as their writings show, as they contain not the remotest attempt at a definition or description of it. We must, therefore, take the initiative on this point.

Suppose we defined dead matter and living matter; then, if our definitions were correct, the gap so awful and fathomless, or the break so bridgeless, is the difference between them. How shall this gap be filled up? There is but one way—by identifying the two, dead matter and living matter, that is, by self-contradiction; for it is a contradiction to define the two in distinction, and yet identify them; and so it is self-contradictory to demand that the gap shall be filled up between dead matter and living matter. Either dead matter and living matter are one, being only two aspects of the same one force and substance, or they are not. If they are, there is no gap or break between. If they are not, it is self-contradictory to demand that the evolutionist shall fill up the gap, which must remain so long as two are two, and not one only.

Evolutionists will not care whether we define matter as all living or as being of two classes, living and dead, though a question might then properly rise as to the meaning of the terms living and dead. But whatever be the point of distinction, all admit that dead matter becomes living through some cause, and the only legitimate question is, *what is the cause?* Suppose the cause is a Supernatural

Being, God, what is it in this case that fills the gap between the dead and the living matter? Nothing. The break or gap is exactly the same between the dead and living matter that it is on the hypothesis of evolution. If the Supernatural Cause is here affirmed or assumed to fill the gap, then the natural cause may with equal propriety be affirmed to fill the gap on the opposite hypothesis of evolution; and the whole and only question is whether the change supposed or known is the effect of natural or of supernatural causation; and the gap, however extensive and profound it is supposed to be, is no more an objection to one hypothesis than to the other; since the power and the mode of the operation of either are known only by their effects.

§ 9. THE GAP BETWEEN VEGETABLE AND ANIMAL
LIFE.

“A second gap is that which separates vegetable and animal life.” This gap is filled or left open in the same way as the foregoing gap. We agree, in one sense—a vague and vulgar no-sense, which we opine is all he means—with his observation that this gap “can be filled up only by an appeal to our ignorance” But in the logical sense, as above expounded, we affirm that it cannot be filled up at all. And finally, in the sense of finding a cause for it, we can fill it up by the inductive inference of a natural

cause as completely as by the induction of a Supernatural Cause.

§ 10. THE GAP BETWEEN DIFFERENT SPECIES.

“A third (gap) is that between any species of animal or plant and any other species.” This sentence, of course, is answered in the same way as the above, and the disputed boundary between vegetable life and animal, and between different species, makes these two gaps at present utterly undefinable; nor is it yet absolutely determined whether there is any such gap as Dawson and his party suppose. Indeed, this is one of the points in debate.

§ 11. THE GAP BETWEEN ANIMAL AND RATIONAL LIFE.

“Another gap is that between the nature of the animal and the self-conscious, reasoning, moral nature of man.” If there is a gap here, like every other gap, real or supposed, it makes no more against naturalism than against supernaturalism, as we have seen. But whether naturalists or supernaturalists, the gap in this and the three other cases may be legitimately questioned and powerfully contested. On this subject we cannot now enter; but, without prejudging the issue, we hope yet to see it more thoroughly and profoundly investigated, and with less real or theoretical partisanship than it has ever yet had.

§ 12. ON A PRIORI PROBABILITIES ON THIS SUBJECT.

In this connection Dawson speaks of the evolution of the animal into man as being "in the highest degree improbable." If we had an established standard of probability, and if his remark were known to conform to this standard, it would be of some force. But we have no such standard. Our only standard is our experience, which is always changing by the evolution of new phenomena; so that every age has had a different standard, and in our age all standards of natural probability are as mobile as the river sands. Hence in all the ages every great fact and truth have appeared "in the highest degree improbable" when first affirmed or suggested. Witness the Copernican system, the circulation of the blood, embryonic transmutations of the human foetus, vaccination, geological evolutions. Probability in regard to new ideas generally means only prejudice; and it can never have any other meaning where, as in the subject under consideration, we can judge only from experience, and have no experience, but only some supposed remote analogy, to guide us.

§ 13. ON THE CONCEPTION OF CREATION IN RELATION
TO ORDER AND LAW.

Having got over these gaps, Dawson proceeds to consider some more assumptions of evolutionists.

He says: "They always refer to creation as if it must be a special miracle, in the sense of a contravention of or departure from ordinary natural laws; but this is an *assumption* utterly without proof, since creation may be as much according to law as evolution, though in either case the precise laws involved may be very imperfectly known." (P. 339.) Evolutionists will be entirely willing to yield this point. It is not the *mode* of creation, but the *proof* of creation that concerns them. As supernatural creation and natural evolution are contrary correlatives, we want to know how to determine when one and when the other is the operation and cause of any given phenomena. With natural force we are familiar, and we always determine a natural cause by its uniform antecedence to its subsequent. Now as the supernatural is the contrary of the natural, it cannot be determined in the same way; but by the contrary way, which is the way of the Bible and of all pretended proofs of supernatural causation. If, on the other hand, supernatural and creative operation is identified with the cause of the gradual and uniform phenomena in nature, it is identified with natural causation or evolution; and the argument is surrendered to the evolutionist. Of course, it is conceivable that the Supernatural Power may work fast or work slowly and gradually toward an end; but still, where the cause is not immediately known, we want a criterion by which we may determine which force, the natural or the supernatural, is the cause of known

effects; and philosophy and common sense have hitherto furnished no criterion except that of uniformity as proof of natural causation, and deviation from *known* uniformity as proof of supernatural causation; and Dawson neither discloses any other, nor, what is infinitely worse, appears to see that his doctrine requires another criterion.

§ 14. WILL-POWER AND NATURE-POWER.

To this Dawson would probably reply by boldly denying that there are two kinds of causes in nature, or rather that there is *any* cause, and by affirming that natural causation is only the operation of "second causes," and that these are not causes at all, but only effects, effects of the will of the Creator. This is old enough to be venerable, if such a quality can ever attach to such a notion. He tells us that creationism reveals "*in will* the *only* source of power actually known to us by ordinary experience." But when the evolutionist replies that he sees no proof of any *will* back of nature and causative of its existence and operation, how is he to be answered? He says: I know there is force in my will; but I only know this force in virtue of its resisting and overcoming other and opposing force; for if there were nothing for it to resist and conquer (or unless it create, which is not supposed and is the point in debate), it could neither prove nor exercise power. I thus know the power of my will and the power of nature in some

degree; and I know that nature so far as known operates uniformly; but I know of no other power. Thus the power of nature cannot be denied; and the conceit of second causes, as being no causes at all, cannot stand; and natural power being admitted, we need to discriminate it from supernatural power, and to furnish a criterion and proof of the latter. Admit a natural power, and on the implicit admission of Winchell and Dawson we cannot furnish a distinctive criterion or proof of the existence and operation of Supernatural Power. Deny a natural power, and on their principles again we can have no notion of power at all, because then we cannot know the will-power, "the only source of power actually known to us."

The physical facts which Dawson appeals to in the last chapter of his book are comprehended in the principles already discussed, and are hardly worthy of a separate notice except by a professed physicist.

CHAPTER IX.

RELIGION AND SCIENCE, BY PROFESSOR LE CONTE.

THE work on Religion and Science, by Professor Le Conte, is an honest and meritorious attempt to reconcile religion with the most recent views of physical science; and the intelligence and fine spirit which pervade it make it valuable. The author turns no sinister aspect upon the doctrine of evolution, though he endeavors to show that back of all nature and through all nature there are evidences of the operations of a personal designing Deity. While doing this he reveals no bitterness and no bellicose dogmatism toward non-theistic evolutionists, though he repeatedly charges their unbelief to their wrong spiritual condition. His style is very simple, direct, and quite didactic, yet always fresh and animated.

§ 1. ON THE DEFINITION OF SCIENCE.

Of the success of his effort we can here speak only in its direct bearing on evolution and the proof of a supreme supernatural Cause, to which we at once proceed in an analysis of the first chapter. He says that "the region of second causes and this only is

the domain of science. Science may, in fact, be defined as *the study of the modes of operation of the first cause.*" It is obvious that this definition is equivocal, because of the disputed meaning of the phrase second cause, and its distinction from first cause. If by second causes he means only a name for effects which are not real causes, allowing causality proper only to the first cause, his definition will not be accepted by men of science and will be rejected by philosophy. If he means by second causes real causes that are dependent for their existence and operation on the will of a Creator of all nature, it will be rejected by evolutionists, as it denies science to all but Theists of the supernatural type of faith. The term second causes is antiquated, as it is either without meaning or has a meaning which can no longer be maintained, and his use of it begs the whole point in debate. Further, to define science, as concerned only with the modes of the operation of the first cause, is to base science on theology, or make it in all its branches a constituent part of theology, so that there is only one science, theology! Moreover, it is not satisfactory to define science by a term that is merely subjective, as a "study" of anything. There is a good deal of study which cannot claim to be called science, though as Theists, or rather as pantheists, we may allow that its objects are modes of operations of the First Cause.

§ 2. CONCEPTION OF GOD AND PROOF OF HIS
EXISTENCE.

His proof of the existence of God is remarkably easy. Indeed, it exhibits a *naïveté* which in the sphere of philosophy is decidedly refreshing. Man "*instinctively* ascends from phenomena to their cause. . . . If, in tracing the chain of causes upward, we stop at any cause or force or principle, that force or principle becomes for us God, since it is the efficient agent controlling the phenomena of the universe. Thus Theism is necessary, *intuitive* and universal. We cannot get rid of it if we would." "Turn it out in" one form, it comes in others; "it may be as magnetism, electricity or gravity, or some other supposed efficient agent controlling Nature." "I therefore repeat, *Theism neither requires nor admits of proof.*" (Pp. 12, 13.)

A Theism of this kind certainly neither requires nor admits of proof. But this is not Theism. Magnetism, electricity or gravity are not God. Some possibly may allow them to be modes of His operation and so to be God Himself, if they are conceived only as "the lower parts of his ways," and if we have also a conception and knowledge of Him as having attributes infinitely more exalted than these. But "if in tracing the chain of causes upward we *stop*" at these as the ultimatum of our knowledge and conception, these are not God in the Theistic

acceptation of the term, but in the atheistic, for every atheist will accept such a god. Indeed, it is just the kind and the only kind of god he believes in—unconscious natural force.

Besides, magnetism, electricity and gravity and their correlate or cognate forces are not “the efficient agent controlling the phenomena of the universe.” They are themselves a part of the phenomena of the universe; and as they are not supposed to control themselves, they certainly do not control the said phenomena. They control nothing except as they themselves are controlled, for they are limited in their being and force; and they wield their force only in losing it, and even in losing their existence by being transmuted into other forms of being and force.

The assertion that Theism neither requires nor admits of proof is inconsistent with the declaration that the knowledge of God is ascertained by the man of culture through a long series of ascents from successive phenomena up to their first Cause, which is certainly what is generally meant by the word proof, and constitutes an argument sufficiently elaborate

This argument is again inconsistent with the declaration that Theism is intuitive, according to the universal usage of the latter term, which always denotes an immediate and direct perception; while the assertion that Theism is universal is absurdly contrary to fact; and such assertions are inexcusable.

§ 3. . PROOF OF THE PERSONALITY OF GOD.

Le Conte's "argument for the personality of Deity is derived from the evidences of intelligent contrivance and design in Nature; or else the adjustment of parts for a definite and intelligible purpose. It is usually called the argument from design." To this argument he adds nothing new either in the way of force or interest, unless it be in a few fresh illustrations of minor importance, while his chief illustration is Paley's watch. Of course all this is without force as against the evolutionist who denies the evidence of design in nature, who, indeed, cannot infer it by the law of natural causation. Le Conte brings in geology to show the beginnings of species; but evolution swallows all such facts at a mouthful and assimilates them all. On this point, however, the author ventures an argument, which we will give to our readers.

§ 4. ON THE WITNESSES OR PROOF-FACTS OF THE
ORIGIN OF SPECIES.

"The question is not how species could have been introduced or ought to have been, or must have been introduced; it is a simple question of how they *were* introduced. It is not a question of speculative philosophy; it is a simple question of history. And, as a question of history, there is no witness upon the

stand except geology. In comparison with her evidence all other evidence ought to be ruled out of court. Her evidence and hers alone must eventually settle this question. Now, the evidence of geology to-day is, that species seem to come in suddenly and in full perfection, remain substantially unchanged during the term of their existence, and pass away in full perfection. Other species take their place apparently by *substitution*, not by *transmutation*." Here it is stated that on the origin of species we have simply a question of history, and that on this question we have just one valid witness. This seems to simplify the case greatly. Yet this simple scheme suggests many questions which in a thorough discussion of it would require to be answered; and the answers would evolve sufficient complexity. We will touch only on one point. Allowing that geology utters what is here put into her mouth, we ask *how*—the mode—does geology give her testimony, and what are its significance and value? She gives it only by facts related to each other in time. Besides these, there is no inscription on the rocks saying: "Species are *substituted*, not *transmuted*." The causes of these successive facts, then, can be determined only by induction in accordance with the law of natural causation; and according to that law, substitution is nowhere, while transmutation is everywhere, and all the earlier phenomena must be pronounced the causes of the later, the changes being only in the forms of the same force.

§ 5. ON EXPLAINING THE ORIGIN OF SPECIES.

Allowing a limited and regulated evolution, Le Conte maintains that an unknown factor must be assumed to explain the phenomena of geology, besides any or all that evolutionists have supposed. "My own very strong conviction, however, is that no theory of evolution yet proposed explains the origin of species . . . much less genera, orders, and classes; that the great factor of change and the real cause of evolution is still unknown. Evolution may be the universal formal law of the universe of Time; but the *cause* of this law is yet undiscovered." In this passage there are three pivotal words which need some consideration — "explains," "law," "cause." Evolution "*explains* the origin of species" if it shows in nature a possible *cause* of species. The *cause* of species is the *power* that produces them. This power is different from law as a mode of anything is different from its essence. Thus, iron may be hot, cold, solid, liquid, in motion, still, in one shape of solid or in another shape, all being modes of the same substance or essence or force. Now nature is a force, and of its nature and extent we have only a partial knowledge, that is, a knowledge only so far as our experience has informed us; and all nature's laws are modes of the operation of this force, and all the phenomena comprehended in these laws are also modes of this force. This force in all its

modes is real, not a mere seeming, and it is known only by its effects, and its specific operations relative to any given phenomenon or phenomena, or what form of its operation is the cause of certain other forms is determinable only by the law of temporal relation, or of uniform antecedence and subsequence. Allowing, therefore, that there is an unknown factor as the cause of the origin of species, this factor can be determined only by induction, and induction can proceed only in accordance with the law of natural causation; and this law justifies no inference beyond some antecedent natural phenomena. Thus the unknown factor as producer of species must be some antecedent forms of natural force, and it must be those forms of natural force which in time (and place) stand in most fixed and intimate relation to the beginning of species. Whether or not evolutionists have hit exactly on just these antecedent forms is of very subordinate consequence; as that does not affect the naturalistic result of the argument. But their *method* of *explaining* the origin of species is certainly scientific.

§ 6. GRADUALISM IN RELATION TO CREATION AND
EVOLUTION.

Dawson charges evolutionists with assuming that creation cannot be gradual. This charge, as applied to them only, is false to history, a natural oversight of an eager disputant. It is creationists that have

made this assumption in the first place for their own ends. On this have been based most of their assaults on evolution; and a very large proportion of their strength and ingenuity has been expended in efforts to reveal "gaps," "breaks," and paroxysms and catastrophes, which it is supposed nature could not fill or bridge, and which therefore require the assumption of a Creator. Nearly all (if not all) Dawson's own reasoning proceeds on this assumption. On this account it became a moral necessity for evolutionists to endeavor to diminish these breaks and chasms as much as possible, and their comparative failures are perpetually flaunted in their face by their opponents. The more judicial mind of Le Conte charges this unfounded assumption on both parties, on "most naturalists" and on "others." On this point he has an excellent paragraph, which we quote:

"But others say the constancy of nature's laws necessitates change by insensible gradations. 'Nature,' they say, 'never goes by leaps.' On the contrary, although laws and forces are constant, phenomena must always change by leaps. Meteorological phenomena, such as storms and lightning—geological phenomena, such as earthquakes and volcanoes, are paroxysmal. Even embryonic development, the very type of all evolution, is paroxysmal always in some of its steps; and in many animals in several of its steps. Is it then inconceivable or contrary to the known analogies of Nature that the evolution of the organic kingdom should also have its periods of paroxysmal

change? On the contrary, it seems to me far more probable that in the evolution of the organic kingdom, as in the evolution of the earth; in the evolution of society; in the evolution of the egg, in fact, as in all evolution, there have been periods of comparative quiet and periods of rapid change. How rapid these changes have been can only be determined by further observations. All I wish to insist on is, that the mind should not be closed against sudden or paroxysmal change by any idea that such change is inconsistent with evolution by secondary causes." (P. 25.) Omit the last three words, "by secondary causes," which are unmeaning unless they beg the question, and evolutionists of the extremest type will gladly accept this excellent paragraph without reservation.

§ 7. ON SECOND CAUSES AS BEING *BETWEEN* PHENOMENA AND THE FIRST CAUSE.

This reintroduction of second causes, which run through his book, suggests another passage on the subject worthy of notice as a specimen of confident and unmeaning speech, too common, and supposed to be very pregnant. "The domain of science is secondary causes and processes—is all that lies *between* the phenomena, the object of *sense*, and the First Cause, the object of *faith*." (P. 23.) We have here phenomena, the object of *sense*; then we have the First Cause, the object of faith; and "*between*" these two

objects there are second causes. He does not tell us of what faculty these second causes are the object, nor by what method or means we know of their existence and operation.—We beg pardon. The next sentence explains this in part. “Science passes from sensible phenomena to immediate causes, and from these to other higher causes, and thus by a continuous chain she rises higher and still higher, until she approaches the Great First Cause.” It would have been a great advantage in point of clearness and definite conception if the many theological writers who have given us this style of sentence had explained to us what they mean by “immediate causes,” and “other higher causes,” which are neither God nor phenomena, but “*between*” the two. They are confessedly unknown to physical science because they are non-sensible; and theology, which affirms them so often and so confidently, ought more fully to explain them, and the method of discovering them, and of ascending on them, as on the successive rounds of a ladder, up to God. All the causes that physical and psychological science know are physical, sensible, phenomenal, internal or external; and all its inferences respecting causes are inferences from some phenomena to antecedent phenomena; and it therefore knows nothing of causes either first or second such as he here describes. We are also left uninformed as to the method of ascension from phenomena to causes, and thus to the summit of the causal ladder. Science is acquainted only with the

deductive and inductive processes, and by these it can infer only causes of the same kind as those which are known to experience, all of which are phenomena; and an induction is always an inference that a certain force known in experience operates or has operated beyond our experience, so that if our experience were sufficiently enlarged, that inferred operation would be a part of the "sensible phenomena" which constitute our experience. Science therefore makes no ascensions above phenomena, and according to this method makes no approach toward God.

§ 8. EVOLUTION IS WITHIN THE DOMAIN OF SCIENCE.

Professor Le Conte concludes his first chapter, in which he unfolds the method of knowing God, with a summary of the false refuges under which skepticism has successively sought shelter. "It takes its last refuge beyond the domain of Science, in the eternity of matter and material forces. Thus in every case it seeks refuge in our ignorance." Here are two assertions which cannot pass unchallenged. We ask the author why is the supposition of the "eternity of matter and material force" "beyond the domain of science"? We suppose he would reply, because it is beyond "the domain of second causes," "the only domain of science," since, if eternal, matter is a first or the first cause—a reply which has already been sufficiently refuted. We

ask the author on what ground he denies the eternity of material force? Does he do it with or without the help of science and philosophy? If without science, then we are equally entitled without or beyond science to take the opposite position. If he uses science and philosophy to reach his extra-scientific position, then we may do the same to reach our opposite extra-scientific position; and the only question to be raised is whether his procedure and conclusion or ours are the most logical; and our argument is that as nature reveals only natural force, she is silent respecting a supernatural Author and origin, so that as evolutionists we modestly refrain from affirming either, and are thus compelled implicitly to deny it or to suspend our judgment. Our conclusion is not therefore a refuge of ignorance, but of rigid scientific parsimony. The opposite conclusion from the same data is more than the data warrant, according to the method and principles which guide scientific researches and conclusions in all other directions.

CHAPTER X.

ON THE ETERNITY OF MATTER.

§ 1. BEGINNING OF MOTION IN RELATION TO FORCE
AND TIME.

HERE, however, we are met by the profound metaphysics of which Mr. Burrit A. Smith, writing in the *New-Englander* for January, 1874, may be taken as a representative, who argues that the eternity of matter is impossible, because its conception involves all sorts of self-contradictions. It would be a great gain to Theism if this were made clear, and if it were also made clear that no such difficulty attaches to creationism and to the eternity of God. Let us give his arguments an examination.

"If matter were inert," he says, "and motionless, it might be difficult to disprove its eternity." We observe, in passing, that matter absolutely inert involves a contradiction, because whatever is is property or quality of some kind, and absolute inertness is no property—nothing. But it is agreed that matter is not inert nor motionless. On this ground he proceeds as follows: "Moving matter must move in time. The motion must have commenced at some

definite point of time, or it must have come down from a past eternity without beginning. If it had a beginning, there must have been some cause for it, and *this cause is God.*" Beginning at the end of this argument, we ask why must this cause of motion be God in distinction from the nature-force with which we are experimentally acquainted and with which the intellect of the absolute evolutionist is satisfied? If one supposed eternal force was competent to a beginning of motion, we see no reason why this power should be denied to the other supposed eternal force. In relation to time and the beginning of motion the two supposed eternal powers are equal, and whatever difficulty attaches to either on this point attaches to both. The difficulty is not objective, but subjective, psychological. It centres in the notion of time, and all such arguments on either side are worthless till we have a satisfactory philosophy of time. What, if when that philosophy is attained it shall clearly appear that time is purely subjective; where then is the force of such arguments? Theism must furnish something better than these antiquated dialectics if it successfully battles with evolution.

§ 2. ON THE BEGINNING OF MOTION AT SOME
DEFINITE POINT OF TIME.

As to the beginning of motion at "some definite point of time," we inquire what definite point of

time that would be anywhere in the vast eternity before motion commenced? We recollect that among the earliest metaphysical reflections of our childhood was a spontaneous or a transient wonder what God did before He created the world, why He did not commence sooner, or why just when he did? But the question suggested an answer which showed the question to be unmeaning, because before and after, when and then, have no meaning, no existence except in relation to something existing and in relative motion. The commencement of motion, therefore, would not be *at some definite time*, for that is nothing and meaningless in such a connection; for it implies that there were measurable times before there was any motion, which is absurd. The converse of the statement is true, that a *definite time was created at the beginning of motion*; and all argument for or against the beginning and cause of motion based wholly on the relation of motion to definite relative time is utterly futile.

§ 3. ON AN AGGREGATED INFINITY.

Assuming that he has demonstrated that the cause of the beginning of motion is a supernatural personal Deity, he proceeds to show that motion must have had a beginning in time, that is, that it cannot be eternal. In proof of this, the somewhat stale dialectics about the impossibility of attaining the infinite by aggregation, so that no possible num-

ber of additions of cycle to cycle can make an eternity; whence "there must have been a beginning, and in the beginning God." But it is very obvious that all this applies with equal clearness and force to the conception of the past eternal activity of God. He must always have been (mentally and volitionally) active, as Theism knows no divine Nirvana. This activity is conceived as successive, and no aggregations of these activities can make up an eternal succession, so that according to this argument there must have been a first thought and feeling and act in the mind of God, and so God had a beginning! This logical antinomy, like many others, originates in our want of a philosophy of time.

§ 4. ON ETERNAL TIME AS A TOTALITY OR A WHOLE.

Against the supposition that one cosmic cycle may be put into a corresponding space of time, and so on for all the past eternity, he objects that this implies that eternal time is a totality, a whole composed of parts, and that this again implies limitation. On this we observe first that a totality or whole is not necessarily composed of parts. The supposition is self-contradictory, and it proves too much, that neither whole nor part is possible. On this principle parts are prior to wholes, which is true in all secondary combinations, but not in the ultimate facts and relations of thought and things. All simple elements,

isolated and uncombined are wholes, for we cannot divide them, else they would not be simple. It is self-contradictory to say that carbon is composed of carbon and something else than carbon; or that sensation is composed of sensation and something else than sensation. All *complex* parts and wholes are composed of *simple* wholes, so that if there could be no wholes without parts both wholes and parts would be impossible. As there are simple wholes which are the bases and elements of all combinations, so we may speak of all time or eternity as a simple whole, and challenge any one to disprove it.

In the next place, we deny the *assertion* that a totality, or a whole necessarily or logically implies limitation; and a denial is worth as much as its contrary assertion in questions of logic. But it will be easy to demonstrate the truth of this denial. Whole and part, or totality and partiality, are logical correlatives; and they exclude each other, and the absence of either in anything implies the presence of the other. Everything that is or is possible is either a whole or a part. If we deny this, we contradict ourselves, and virtually destroy the law of non-contradiction, which is the foundation of logic and of all philosophy. Hence God, not being a part, is a totality or a whole; and Theism considers Him infinite. Eternity, not being a part (of time), is a whole; and it is a contradiction in terms to suppose that it is limited as duration.

§ 5. REFUGE OF WEAKNESS.

Against the objection that his argument precludes the eternity of God, he argues as follows: "We are creatures of time. Otherwise is He; else the supposition is valid." "Man occupies a given space; he has locality, and can pass from one portion of space to another only in succession of time: God is not held by the confines of space, and never goes from place to place." God is not the subject of any changes through all the succession of time, and is here contrasted with nature and man; and as to space and time, "He fills one as he fills the other." It is admitted that the subject is not without difficulty, and it is affirmed that "by reason of the limitation of our faculties we are unable to form a notion of God's timeless existence; but it is not above our comprehension that there should be such an existence;" and he concludes with reflections on judging of God from ourselves, quoting the Scripture passage, "Thou thoughtest that I was altogether such an one as thyself."

Thus the reviewer, who engaged at the outset to refute absolute evolution by logic, becomes, before he gets through, evidently conscious of failure, pleads the difficulty of the subject, the limitation of our faculties, reads us a religious homily, and supports it with Scripture. Could he not see that his opponents can make as much of the limitation of our faculties as he can; and with equal or greater justice, as they

have done in positivism and nescience? Every contrast that he has drawn between God and nature and man relative to time is either questionable in fact or it is a *petitio principii*. That God never knows any change we deny, and call for proof. If God creates anything, He establishes or creates a relation between it and Himself; and every creative act must be a new subjective state, else it is not creative. That God's action does not belong to time, the same as the motions of matter, begs the question; for it assumes His existence in contrast with nature. It defies logic, virtually saying self-contradiction is valid against the eternity of matter, but not against the eternity of God. It contradicts our psychological conception of the mode of His activity, for we always conceive his acts as successive.

It is singular folly to suppose absolute evolution can be refuted or damaged by such a process as this. It is a part of Spencer's philosophy that all ultimate deductions are apparently self-contradictory. And in relation to space and time, according to the popular notion of them, every conception of God is self-contradictory. To mention only one, that He is all in every part always. If He is all in one place, He is nowhere else. If He is a part in all places, He is infinitely divisible. Evolution is the latest product of human thought; and the argument which refutes it must be equally original and more profound and comprehensive; and not a stale rehash of mediæval metaphysics.

CHAPTER XI.

MISREPRESENTATIONS AND LOGICAL BOOMERANGS
LAUNCHED AGAINST EVOLUTION.

WE have previously complained that evolution is not understood by its opponents, and that these seldom understand the force of their own arguments. We have already incidentally given many proofs of this as we have passed along. We now propose to devote a chapter to the exemplification of this and kindred mental phenomena. Yet we will not range over all modern literature for examples. We will confine our range to the latest champion of orthodoxy against evolution, that sparkling spoiler of Spencer's pride, B. P. Bowne, as a representative of his class, whose little book contains vastly more of such things than we can afford space to notice, for it is full of them; and the points which are the most telling with his party, are often the most free from all taint of that primary and necessary wisdom which knows itself and what it is doing. We might properly let this chapter be without classification and topical divisions, as a melange is most suitable to the subject; but for the reader's sake we will classify and designate topics.

§ 1. ON COSMIC INTELLIGENCE.

“The thorough-going evolutionist, availing himself of the doctrine of the unity of forces, passes with firm step through the animal and vegetable kingdoms, and finally brings all things home to the parentage of matter and force. He drives back beyond all life, beyond all form, beyond even the present material elements, back to the raw and faint *beginnings of matter and force themselves*. At that distant point there are no such *myths as life and mind*. . . . Mind is not the *beginning and primal cause* of things, but is the final *outcome* of nature. . . . Not merely the forms and disposition of matter, *but life and mind*, have all been evolved by necessary *physical* causation.” (Review of Herbert Spencer, pp. 11, 12.)

Evolution does not carry us back to the “*beginnings*” of anything except certain transient forms. It is one of its fundamental doctrines that it knows nothing of beginnings, but only of phenomenal changes. Least of all does it profess to carry us back to the “*beginnings*” of *force and matter*. It does not know that these had any beginning, much less beginnings. It recognizes force and matter, but for aught it can tell they are eternal. That they had a beginning and that their changes are traceable back to their beginning, is the distinctive doctrine of the *opponents* of evolution, not of its advocates.

Of course, "at that distant point there can be no such *myths* as life and mind," because "myths" have their "beginnings" in philosophy, which is subsequent to life and mind. But there may have been life and mind at that distant point; and according to evolution there must have been, because there were matter and force, and these are one with life and mind. They differ only in their form, and are substantively coeval, whether temporal only or eternal.

Life and mind, in their essential substance and force, have, therefore, not been evolved at all. Evolution infers that they are eternal. If they are not eternal, but were created, still they are the very things in substance that were created; and so in either case they themselves in substance and force have not been evolved; and it is only their varied *forms* that have evolved. Least of all is it true that they have been evolved by "PHYSICAL causation" distinctively, in the sense in which the writer uses that phrase. He assumes some essential and mysterious distinction between physical causation and some other or super-physical causation. Now any other known form of causation besides what he here calls physical, if there is any other, is not excluded by evolution. It never limits its notion of causation to physical causation, in Bowne's narrow meaning of the phrase, but extends it to all known causation, of whatever form. This phrase is no creation or special favorite with evolutionists, and it is very doubtful whether it has ever once been used by them as a comprehensive declaration of

the causal agency. So far from causation being always physical to the exclusion of mental causation, even in the earliest stages of the Cosmos, it is never so, because the two are inseparable and indiscriminable—one and the same. Such misrepresentations as these are epidemic in his book, and they abound in all orthodox discussions on evolution.

As a proof of his correctness in this exposition, however, he quotes Tyndall. "I am not misrepresenting the theory. Professor Tyndall says of it, 'Strip it naked, and you stand face to face with the notion that not only the more ignoble forms of animalcular or animal life, not alone the nobler forms of the horse and the lion, not alone the exquisite and wonderful mechanism of the human body, but that the human mind itself—emotion, intellect, will, and all their phenomena—were once latent in the fiery cloud.'"

Thus far Tyndall. Mr. Bowne adds: "In this evolution there has been no *guiding Mind*, but only the working of physical force." Why did he not leave Tyndall to say this? Tyndall has not said it. Neither has Spencer said it. They do not believe it. They believe its exact opposite, that "in this evolution there has been a guiding mind in the working of physical force." Tyndall's quoted words affirm this; for he says "that the human mind itself—emotion, intellect, will, with all their phenomena—were once latent in the fiery cloud"—*were* there, though latent, yet really there just as the matter and

material force of all organic forms were there. The inherent force of this apparently eternal substance, whether it is called intelligence or mind or matter, has acted according to its nature, and this nature has inevitably secured the result; and Theism must represent God as acting according to his nature, so that it is His eternal nature which determines all issues, so far as they are His action. In this respect there is no difference between the eternal Force or Power of evolution and the eternal Power of Theism.

Mr. Bowne here adds that "one aim of Mr. Spencer is to show that an *intelligent* Creator is needless." The word "intelligent" is false so far as any significance is attached to it; for Mr. Spencer does not oppose intelligence, but only creation. He does not deny intelligence in the great evoking power. On the contrary, he affirms that its intelligence may be of an infinitely higher order than that which our consciousness unfolds, and which is Bowne's type of his Deity and Creator.

Further, in the paragraph next to the one from which the above words of Tyndall are quoted, there is a passage to the effect that this evolution of the forms of human consciousness from the fiery cloud appears absurd only because of the vulgar notion of matter, which notion evolutionists reject, while Bowne and such as he persist in imposing it upon them. This passage is as follows: "These evolution notions are absurd, monstrous, and fit only for the intellectual

gibbet, in relation to the ideas concerning matter drilled into us when young. Spirit and matter have ever been presented to us in the rudest contrast, the one as all noble, the other as all vile. But is this correct? . . . Upon the answer to this question all depends. Supposing, instead of having this antithesis of spirit and matter presented to our youthful minds, we had been taught to regard them as equally worthy and equally wonderful, to consider them in fact as two opposite faces of the self-same mystery," we should not then have had this mental difficulty. . . . "Without this total revolution of the notions now prevalent the evolution hypothesis must stand condemned; but in many profoundly thoughtful minds such a revolution has already taken place. They degrade neither member of the mysterious duality referred to; but they exalt one of them from its abasement, and repeal the divorce hitherto existing between them." This is a plain declaration that evolutionists do not exclude the essential power of mind from the fiery cloud. Had Mr. Bowne seen and accepted this declaration in its real and full significance, instead of forcing his own superannuated notion upon him and his fellow-evolutionists, he would have revealed in himself a good deal more of that superior form of power for which he exclusively appropriates the title of mind, which in Tyndall and Spencer is a power to comprehend themselves and their opponents, and to treat the latter with consideration and candor.

§ 2. ON MATERIALISM.

It is from this loftier conception of matter that Spencer denies, and justly, that his doctrine is legitimately stigmatized as materialism; and it is strictly true, as he affirms, that the dispute on this topic is a war of words, because a new meaning is attached to matter; and to be a materialist with the new notion of matter is not to be a materialist in the sense in which those of the old notion charge it on the new doctrine. According to the new idea, to be either materialist or spiritist is to include the positive element of both.

§ 3. ON ASSUMPTIVENESS.

Assumptiveness is a quality which is often charged on evolution. "That mental force is but transformed physical force is the primary *assumption*" of evolution is the assertion of Bowne. We met this assertion in Dawson; and showed that evolution makes no primary assumptions whatever, nor any other assumptions. It begins with knowledge, with the facts of consciousness; and it is what it is simply because of its refusal to travel beyond these. We know force in knowing these facts, and we know its phenomenal changes and operations, that there has been, and still is the known fact of evolution. This is the extent of our knowledge; and this is therefore the extent of our assertions. The opponents of evolution, on the other

hand, know no more, and yet assert more—the beginning and the creation of this force, and the existence of a Being substantively and qualitatively different from this known force. It is they only that deal in assumptions, and their assumptions are of infinite magnitude.

§ 4. ON INORGANIC SIMPLICITY OR ORGANIC GERMS
AS A FOUNDATION OF EVOLUTION.

By the aid of Tyndall, misusing a fact he states, Mr. Bowne charges evolution with deriving a factitious support from the assumption of simplicity where there is no simplicity. If the simple can be transformed into the complex, he represents evolution as arguing, it is hence easy to suppose the transformation of the inorganic into the organic and the lifeless into the vital. But, replies the sharp critic, there is no such thing as simplicity known to us, as Professor Tyndall has shown. Spencer will be entirely willing to accept this alleged fact of the non-simplicity of things and its logical consequences, but not the attendant charge and insinuation. The assumption of simplicity is not necessary to evolution; and evolution has never based anything upon it, and hence we have given it no place whatever in our epitome of the arguments for evolution.

Either some things are simple or they are not. If they are, they afford to evolution the advantage arising from their natural transmutation into the

complex, an advantage of great importance apparently in the estimation of this acute critic, since he labors so hard to destroy it. If, on the other hand, nothing is known to be simple, and if we have no right to suppose that anything is simple, then the complex is eternal, unless it was created. But as we know nothing of beginning and of creation, but only of existence and phenomenal changes, we accept the other alternative, which is much more favorable to evolution, if possible. The existence of organic complexity below the microscopic limit, and possibly beyond all power of analysis and discrimination, makes it possible that all the later and larger and more complex organisms are but the natural evolution of said indeterminable organic germs. Thus the tables are turned upon the critic. His argument is a logical boomerang which he is so delighted to discover in the hands of Spencer. It is much easier, in view of received ideas, to construct evolution from complex and organic germs than from the simple and inorganic.

§ 5. ON CHANCE.

Mr. Bowne considers intelligence and chance as logical correlatives, and that therefore where the former is wanting the latter operates; whence it follows, in connection with the supposition that there is no intelligence in the earlier or lower stages of cosmic changes, that there nothing but chance operates,

and that chance is the cause of all things till man's intelligent agency is evolved. Of course, if there is no intelligence before the evolution of man, and if all other force is mere chance, it follows that the entire grand panorama of the cosmic universe, of vegetable formations, and of brute life, are the product of chance; and the ancient goddess of chance must be restored to her throne and sceptre. To ridicule evolution it is sufficient to state this as its doctrine or its logical tendency and legitimate issue. This kind of ridicule evolution has met with from the first. But it only shows the incapacity or the dishonesty of those who resort to it, and therefore with the knowing ones it only confirms evolution.

The foundation is knocked from under this by the assertion of the true evolutionary doctrine of cosmic intelligence, so that there is no room for the operation of its supposed logical correlate—chance.

Further, chance is not the correlate of intelligence merely, but of necessity, of regularity and certainty. Whatever takes place with absolute regularity and uniformity according to its antecedents, so that, the antecedents being known, the consequents can be predicted, is not a process or product of chance. Now this regularity would obtain though the cosmic force were not intelligent; and if there are any evolutionists who deny or doubt the intelligence of the Cosmic Force, they are still invulnerable to the charge of holding the silly old atheistic doctrine that the world and its cosmic forms have come by chance.

This Force, so far as known, is eternal, and the cosmic processes and order are its necessary, not its accidental, result. There is not a chance motion in the universe. If not designed in the same sense as we design, yet every motion has a predetermined speed and direction and destiny and result.

The significance of the word chance is purely subjective, and not only generally so, but relatively to individual knowledge. Neither Theism nor naturalism allows of any chance proper. The only legitimate use of this word with either party is to describe events whose law we have not yet determined, or the particular causes of which events under a known law we have not ascertained; and in using the word thus the admitted implication is that really and ultimately there is no chance, but that the word is only an expression of our ignorance.

Though the opponents of evolution like to ring changes on the blindness of the cosmic force, on the non-existence of intelligence prior to man, yet when it suits their turn, they can clearly see that according to evolution, the original chaos contains essentially all that the subsequent cosmos reveals. Thus this same critic (p. 21) says: "Because of the *necessity*"—here it is *necessity*, not chance, observe—"which connects cause and effect in every *mechanical scheme*, we must conclude that all which exists now existed in its causes in the time past. The nebulous period really *manifested* no less intelligence than the present does; the only difference is that

what is explicit now was implicit then." We are glad to see here the true doctrine of evolution admitted respecting the existence of cosmic intelligence previous to animal life. By this admission his assertion, frequently repeated in different forms, that "in this evolution there has been no guiding *Mind*, only the working of *physical* force," in distinction from mind, no operation of intelligence or wisdom, but only chance, appears clearly stamped as a wilful and unscrupulous caricature of evolution. Still this is a very harsh charge, so that we will not make it; and we charitably modify it by saying that the writer was probably self-blinded, like those of whom another said, "they know not what they do."

In making this just admission, however, the writer uses stronger language than facts warrant—a habit with him, which he will correct as he grows wiser. It is not strictly true that "the nebulous period MANIFESTED no less intelligence and purpose than the present does." It is strictly true, we believe, that the nebulous period *was* just as intelligent as the present. But this intelligence was not just as clearly and fully *manifested*. There is quite a difference between the existence of intelligence and the degree of its manifestation, which those who are able to comprehend the philosophy of evolution have not overlooked.

We must also, in justice to the writer and to evolution, briefly animadvert on another phrase in this quotation. He describes the doctrine of evolution as a "mechanical scheme." This is a favorite phrase of

his. Now the epithet mechanical is always used to designate molar motion and its laws by mere impact and the action of masses upon each other as masses by the force of gravitation in reference to solids and liquids, or the contraction and expansion of these and of gases by the force of heat. But this does not comprehend all the forces of evolution, but the merest fraction of them; and evolution is belittled and caricatured by the use of the epithet mechanical to describe the totality of its processes. It is an unworthy rhetorical dodge, and its aim and result with those who are sympathetically disposed is sophistication. It is paralleled by his use of the phrase "*physical* causation," which we have had occasion to notice before. And this suggests, further, that the epithet mechanical is frequently if not generally used to exclude intelligence and purpose. Falling bodies and expanding fluids are supposed to fall and expand without thought and purpose; and so of all the recognized mechanical activities. It is evidently in this sense that he uses the term, and it is certainly in this sense that his admiring readers will understand the term; and thus a terminology is adopted and conspicuously exhibited, which misrepresents what should be refuted, and which becomes inevitably a vehicle of ridicule and reproach. If there are other forces than mechanical forces; and if under all and through all there is an intelligent Force, which he in this passage confesses is the integral doctrine of evolution, where is the honesty or the semblance even of dia-

lectical fairness in describing the doctrine of evolution as only a mechanical scheme? Or is it the prerogative of Theism and orthodox Christianity to ignore the common rules of honor and rectitude in debate with their supposed enemies?

§ 6. BIRTHDAY OF COSMOS.

The origin and first operation of the cosmic forces is a source of great trouble to the opponents of evolution. They brood over their mental chaos in so unscientific and weird and senile a style that they are worried and nervous and fretted out of all dignity; and they keep poking the matter in the face of the evolutionist, and they stare with astonishment and much provocation to see him remain unmoved and utterly indifferent, and put the subject away with the quiet and modest remark that he knows nothing about it, that it apparently transcends his limited abilities, and that if his excited opponents had a little more of the modesty of true science, and a little more of the wisdom of true philosophy, they would feel on the subject just as he feels. He knows as much as they, affirms what he knows, and no more; and he suggests that they had better go and do likewise, and so spare time and strength for more profitable studies.

But they persist, and reiterate the oft-refuted argument: "No matter how far back we go; if we assume that the nebula was the ruins of an earlier

system, which had in turn been born from an antecedent nebula, still, at the earliest time, we find the exact and complex adjustment of tendencies and powers which in time must give birth to to-day. Looking around upon that earliest nebula, we *find that the present was there* ; and again we ask what determined that *first day*. What *procured* that primal balance of poles and powers which made it impossible that anything but the existing order should be born ? ” To this repeated question we make the repeated reply, that the existence of this “ *first day* ” has not yet been “ determined.” When it has been settled and agreed on that there was a first day, an absolute beginning of the operation of the cosmic forces, then we will admit the question “ what determined ” that beginning, which till then is irrelevant. So the synonymous question, what *procured* the primal balance of poles and powers, etc., must be deferred till we have ascertained that they were *procured* at all, or that their essential force and being did not always exist. On this point we refer the reader and the critic to our chapter on the Eternity of Matter.

Before passing to another subject, we ask the reader to notice how clearly **this** writer can, when it suits him, recognize the existence of mind in nebula : “ Looking round upon that earliest nebula we find that *the present* was there ; ” and “ the present ” surely includes mind.

§ 7. VALUE OF FEELING AS AN ARGUMENT.

Science and philosophy cannot question the power of feeling as a *motive* wherever it is asserted. But we may rightly question its power as an argument. These two points are often confounded and either identified or considered as inseparably united. Thus, Mr. Bowne says: "When Mr. Darwin presents his limited doctrine of the origin of species, we *feel* that there is an enormous disproportion between the vast conclusion and the scanty evidence; but when the problem is to give an a priori recipe for the universe, this *feeling* is greatly increased." Mr. Darwin and Spencer and others evidently "*feel*" very different from this writer on these topics. If feelings are of value, whose feelings are to be respected when there is a conflict of feeling? We suppose, those feelings which appear on investigation to be supported by the best arguments. Hence, the less we say about feelings the better, as the feelings may be only the result of prejudice or incompetency to apprehend the determining facts or to comprehend an argument, which are all that science respects.

Unmoved therefore by the way any one *feels* about the doctrine of Darwin and Spencer, we unfeelingly ask them *why* they feel so, or what is their reason for so feeling? We do not *feel* scanty evidence, and enormous disproportion between small premise and a vast conclusion. We see or perceive these things; and it

is better to say so instead of using a word of entirely different meaning. Such use of language in what should be purely philosophic discussions proves the writer to have small philosophy, and that it is his preferences and not his understanding that he is chiefly considering and fostering; and his appeal is made not to the pure intelligence, but to the preferences of his readers. No argument can refute a feeling, and as we have only arguments to present, we let the feeling pass without further notice, as beyond our reach. It is very evident that Mr. Bowne and his sympathizers have plenty of feeling, and there is no sign of its growing any less. We opine that the change will be mostly in the other direction for some time to come; that is, until they substitute thought for feeling as an argument.

§ 8. VISIBLE AND INVISIBLE CONDITIONS AND CAUSES.

The doctrine of correlation, he says, "holds the first place in every scheme of evolution," and against this he lays out his strength. (See p. 90-145.)

"If there should be such a correlation there would be a possibility of finding the present order potentially existent in the primeval mist. The *possibility* might be very *slight*." If there is such a correlation, there is no mere *possibility*, or *probability* slight or strong, but a *necessity* of finding this cosmos potentially in the old chaos, since the correlation is the **IDENTITY** of force under different forms.

He meets this by the assertion that the known correlation is only "a correlation of motions, not of forces." If this were true, then moving bodies are not forceful, and their collision in no case produces any effects. The assertion is too absurd for refutation. A body in motion is a force, and it transmits a portion of its force to all bodies against which it impinges. This is one of the first lessons of natural philosophy. And this is an exemplification of the correlation of forces, the same force passing into other forms. If this is denied, there is an end of discussion, as reason and fact are alike ignored. On motion as a force, see our first chapter.

The known constant connection of heat, light, motion, and vital action, he tritely affirms, only proves that the last is *conditioned* on, not *caused* by, the former, as the "bricks and mortar are conditions of the builder's activity, but they are not the builder," a point taken by Winchell and others. But the *builder here* is a visible *phenomenon* equally with the bricks and mortar. Not so is the *Builder of worlds*. If the builder of houses were unknown to any of our senses, if clay were known after a uniform plan or order to turn to bricks and then arrange themselves into houses without a visible or sensible builder, we should have to inquire whether the process were due to invisible spirits, superior to nature, feeling and thinking and planning and willing like ourselves, or whether it is the result of the inherent properties of the clay and of its persistent

and concomitant connections; and if the properties of the clay were known only from the nature and subsequents or consequents of its motions, we should have no reason to assume that all such processes were not the natural result of its properties; and we should have no criterion of distinction between conditions and causes, except the point of constant or variable connections. Thus, in the supposed case, the clay and its concomitants, which always precede and are always followed by brick-making and house-building, must be considered the cause, and not *merely* non-causal conditions of the consequent bricks and buildings. It is thus that we must affirm that the earlier uniform cosmic antecedents are the real causes of the later cosmic movements, and nebulae and gravitation are the first great cause of all.

This argument is repeated by Bowne on page 253, a florist and his flowers, as being prettier, being substituted for the mason and his bricks.

His argumentation against physical and vital correlation we shall notice only so far as it has not been distinctly refuted in our previous expositions.

§ 9. EVOLUTION AND POSSIBLE IDENTITY OF FORCES IN CORRELATION.

It is *partly* true that, as Mr. Bowne affirms, "the gist of Mr. Spencer's argument is this. Without sunshine there can be no plant or animal life, hence sunshine and animal life are one. Without heat the

chicken cannot be hatched, therefore heat and vitality are identical." "At the most this only proves the POSSIBILITY of their identity." This possibility is enough for evolution to start with, as it can easily be turned into a probability, and ultimately into a necessity, as we shall soon see.

In the first place, possibility is all that is needed to furnish a philosophical support for evolution. We have before us the phenomena of succession and concomitance, of uniform and necessary connection in time of heat and life. Now the question is, what connects them? What is it that makes heat so necessary to life? Is it the will of an invisible Power, without any actual causation of one thing upon the other; or is it their intrinsic force and nature, by which one thing in certain connections generates the other, without passing over into or being transformed into the other; or is it because in certain connections one generates the other by passing over into the other or by being transmuted into the other? These questions exhaust the catalogue of alternatives, and the answer must be an affirmation of one or other of these three suppositions.

The second supposition is the one which men of science would have adopted very generally twenty-five or thirty years ago, that is, before the law of physical and vital correlation began to obtain. The third is the one which they generally adopt now. The first is the one that old-time metaphysicians and divines generally held and hold still.

Now observe that we are not seeking facts of consciousness nor facts of sense, but a philosophical explanation of such facts known and agreed on. We ask, then, respecting the first possible explanation, whether we shall adopt it? As an orthodox divine, this was the author's theory once. He has changed his views for the following reasons. Because (1) he finds that everything, whether matter or mind, creature or Creator or neither, is an intrinsic force, which makes the second or third supposable explanation necessary. Because (2) this requires a vast and unwarranted assumption. It requires the assumption of an infinite Being substantively different from the known universe, the Creator and sole operator of this universe. Surely there is a vast disproportion between this immense assumption and the familiar phenomena to be explained. It is infinitely more than the mountain in motion for the birth of a mouse. Because (3) this notion of a powerless universe operated by an immanent Deity, in it but not of it, involves, as we have seen, many self-contradictions as well as contradictions of the Bible. Because (4) the assumption contained in either of the other two supposable explanations is infinitely less than this, so that they are philosophically preferable in an infinite degree. Because (5) the intrinsic force of matter, or the latter assumption, so called by us by way of accommodation, is no assumption at all, but an immediate knowledge; since the conception of anything logically contains or rather *constitutes*

the conception of a force, the contrary supposition being self-contradictory. We therefore reject the first supposable explanation as being every way untenable.

Shall we then accept the second? Of the second theory we accept the first part, not as a theory, but as a known fact, that things are forces, and that there is a causal connection between events, one thing causing others to be. But shall we then adopt also the remainder of this theory? We are compelled to dissent for the reason that all known natural causes disappear with the production of their effects; or in other words, that no result is ever attained except by the expenditure of some equivalent force. With the consumption and disappearance of certain forms of carbonic forces or products we have a new muscular energy, a new form of carbonic force. With the consumption and disappearance of our muscular energy and of the igniting substance on the tip of the match by friction there comes a new form of force in the flame, and the flame continues only as the match continues to disappear till both perish together. Nearly all the solid structure of all organic forms, vegetable and animal, is carbon. What and whence is carbon? It is organized sunbeams. Sunbeams are everywhere in suitable conditions producing carbon, and they utterly disappear with the production, while the carbon in turn disappears in the production of the almost equivalent of sunbeams, heat.

What then becomes of these disappearing forces?

Are they annihilated, or do they exist still, though in other forms? There is no other alternative than this. Their annihilation cannot be admitted for a moment; for then every change of form would be an annihilation and creation of a new force and substance. We therefore accept the second horn of the dilemma, that the disappearance is a transformation, and consequently the new form must be the same force and substance as that whose form has disappeared and become replaced by this new form. Hence effects as effects are identical in force with their antecedent causes as cause. Then we have been inevitably led to reject the second theory, and to accept the third, that natural effects are transformed natural causes, the latter having become the former in the very process of operation as causes.

Without a theory, we everywhere and always identify things whose forms appear and disappear in each other, as the clay and the brick; the fuel, flame, and smoke; food, blood, brain, muscle, bone, viscera, and excrementations; seed, soil, sun, air, moisture, and plant; hydrogen and oxygen in water; water, heat, vapor, steam.

The possibility of this identity makes it preferable to its opposite, because it is simpler and less assumptive. But no sooner is the possibility granted, than the necessity of it is forced upon us in order to preserve self-consistency, the first law of thought.

§ 10. ON REFUTING ASSERTIONS.

“Now if a believer in vitality should choose to say that there is a constructive or directive force in the body, which, while *separate* from the physical *forces*, does use those *forces* as its *agents* in construction and function, what is there in Mr. Spencer’s argument to disprove it? There is *not one word* which makes against such a hypothesis; yet he moves on apparently without any suspicion that any proof is desirable. . . . Whoever has proved the correlation of physical and vital forces, Mr. Spencer has not; indeed, one who can thus confound the *conditions* of activity with the *power* of acting has not even understood the meaning of the problem, to say nothing of solving it.”

Mr. Bowne is nearly right in the assertion that if a believer in vitality should *choose to affirm* a spiritual power distinct from the physical forces and superior to them, and that it uses them for its own specific ends, Spencer has said nothing that absolutely disproves it. It is generally hard, often impossible, to prove a negative; and this is one of the cases of the impossible. The knowledge of this is probably the reason why Spencer “moves on” without making any attempt. He imprudently supposed that his opponents understood the situation better than they do. It did not occur to him to imagine that they would be such bad jurists as well

as such bad logicians as to require him to prove an ultimate negative.

As this is impossible, so neither is it necessary for the proper support of evolution. Here also Spencer gave his opponents credit for a perspicacity they did not possess. A man is not entitled to affirm whatever he chooses without a reason or because nobody can positively disprove it. We might "choose to say" some things about the condition of Mr. Bowne's brain which no one can disprove; and no one would feel under any obligation to disprove them. The onus probandi would rest on us who "choose to say" or affirm such things. So if a believer in vitality chooses to assert a substantive dualism of matter and mind, and that the latter is the constructive and directive agency which uses and controls the former, he must prove what he thus "chooses to say," or like Spencer we may be entitled to "move on without any suspicion" that any disproof is required, or that it is entitled to any. It is enough for his opponent to say that the facts known and agreed on do not *necessitate* such a theory, that this may possibly be true, but that we have no right to affirm it, because a simpler supposition is sufficient to explain the facts, or that a simpler theory may possibly be true, and is therefore preferable. Till this simpler theory is proved impossible, it has superior claims on our credence; so that while we are not obliged to disprove the possibility of dualism, he is obliged to disprove the possibility of its opposite. (Another "boomerang.")

§ 11. WHETHER MATERIAL PROPERTIES EXPLAIN
ORGANIC CHANGES.

In this connection Mr. Bowne has given a true statement, so far as it goes, of the point at issue, in the following words: "A living organism manifests properties so different from those of inorganic matter, that, unless some plausible explanation can be found in the *properties* of the latter, we must assume some *peculiar power*, some *distinct cause*, to explain the variation." Every word of this is perfectly just. On the principle here enunciated the evolutionist proceeds with his observations and draws his conclusions. In his estimation the "*properties*" of matter explain the variation from organic to inorganic, and from the latter to the former; and the opposing party has a contrary opinion on this point. Now we inquire, which of these is right?

In order to determine this we must be agreed on another question: On what principle shall the determination be made? This is a question which is of essential importance, but has never been put with sufficient distinctness by either party, and it is entirely overlooked by the author under consideration. We therefore repeat the question more definitely and fully: On what principle shall we determine what are and what are not the properties of matter? The two parties differ in their judgment respecting these properties. One party affirms and the other denies

that it is possible for the properties to explain the variations with which in the relations of organic to inorganic matter we are entirely familiar. How shall we decide the dispute? It must be settled by an appeal to some admitted principle. What is that principle? Or by what principle do we universally determine the properties of matter?

The universal answer, practically and theoretically, is that *we determine the properties of matter by their effects*. To the next question, how we determine their effects, the answer is equally explicit and emphatic, that we determine effects by uniform local and temporal connection. Now there are certain inorganic phenomena thus connected with organic phenomena, and certain organic phenomena connected with mental phenomena. Hence we are shut up to the conclusion that there is a causal connection between these several classes of phenomena; and that, as the causes disappear in their effects, the causes and effects are in force and substance the same. Thus we have proved by the universal and only method of judging, that the "properties" of matter "explain the variation" of which he speaks.

This argument will answer all the oft-repeated questions made by this author and others with a triumphant air, such as the following: "Grant that the heterogeneous is unstable, why should it not fall into a chaotic heterogeneity? Why should not the heterogeneous changes cancel themselves, that is, why should not the result of one heterogeneity be

to cancel a previously existing one? Why should there be any progress at all? Most of all, why should there be any orderly and intelligent series of changes such as are here exhibited? Chaotic heterogeneities are infinite; how does it happen that this overturned homogeneity escapes all those and lights upon a heterogeneity which is impact of intelligence, foresight and purpose?"

It would be logically enough for the evolutionist to parry the force of such interrogations by reversing them, asking with equal confidence and triumphant tone, *Why should all these changes not be just as they are?* Then what he affirms of Spencer falsely will be true of him, that "there is no answer to these questions in anything which Mr. Spencer (Bowne) has said." (Another boomerang.)

But evolution can do more, and does do more. It points to the fact that these alternatives which he inquires about as if they never did occur and wondering why they do not, are of constant and infinite frequency. The comparatively homogeneous often falls into "a chaotic heterogeneity," and an "orderly and intelligent series of changes" is often apparently and strikingly wanting. "Heterogeneous changes" often "cancel themselves," or rather each other. It often does happen that "this overturned homogeneity" does not "escape all those" "chaotic heterogeneities," and does not "light upon a heterogeneity which is impact of intelligence, foresight and purpose," else there could be no chaotic heterogeneities,

which he affirms are infinite; so that his affirmation of this and its appendage is another boomerang.

But the final and ultimate answer is, that things are as they are because force is what it is, that the phenomenal order which he admires so ostentatiously as to insinuate that it must have escaped the notice of all other men, is what it is exactly because the sum of nature's force is what it is, which force is known only by these very results; so that all questions as to why things are not otherwise is an ultimate absurdity, because transcending an ultimate knowledge and fact. Suppose we ask the Theist why God does what he does? He will answer, "Because of His character and attributes." But suppose we now ask why are His attributes what they are? He has no answer except that they are eternal and necessary. Well, suppose nature is eternal and necessary? To base an argument on the assumption that she is not is to beg the question, which all these questions do.

§ 12. ON THE ORIGIN OF GERMS.

Mr. Bowne affirms that "the standing answer of the correlationists is, that the peculiar chemical combination explains the facts." This is not *the* standing argument of the correlationists. He has left out the fundamental element. It is not the *combination*, but the *FORCE* which operates in all combination and secures the peculiar chemical combination

in question. The standing argument, then, when properly stated, is that force in peculiar connections and combinations explains the facts. Supposing that this is what he meant, though he did not say it exactly, we will notice his refutation of it in the following items.

“In the first place, if this theory were true, the difficulty would not be explained. Life comes only from life. There is no proof at all of any vital passage from the inorganic to the organic. To the conclusion derived from Tyndall’s experiments on floating dust and germs the theory of spontaneous generation has not made any effective reply.” Nor does it want to. Neither Tyndall nor Spencer are careful to answer in this matter. They can afford, if they choose, to rest content with the reply already given in anticipation by Spencer, at which, through incomprehension, this writer so politely sneers, that if germs had a beginning, it is not impossible that they should originate in cosmic conditions which have now passed away, so that they can originate no more till the same conditions return. If the same force operates differently in different connections, as we know it does, it follows that the origination of germs in a different cosmic state than what now obtains is possible; as it is also possible, on the other hand, that they were created; but as the former of these suppositions or hypotheses is far the least of the two, it is far the best of the two.

But what evidence have we that they do not

originate now? There is no answer except that we do not see them originate. But this is not conclusive. Our ignorance is not a proof. It would not indeed be fair to demand of them a proof that they do not, as we should be requiring a proof of a negative, and thus commit the logical crime for which we have had to rebuke them in their demand that we should prove that there is not any God or spirit distinct from nature. But while we refrain from making this demand, we do demand that they shall consider their doctrine to be what it confessedly is, an unproved hypothesis, and perhaps unprovable. Then there is its correlate hypothesis, that germs do originate now, which is also unproved as yet. On this side is the evidence that germs have had a beginning, since, as they cannot live in fire, it is supposable they could not live in some of the past cosmic states. Next, if they do begin to be now, we should not be likely to have indubitable and indisputable evidence, because of the minuteness and the intrinsic occultness of the process. As to minuteness, the beginning would be below the microscopic limit, so that when it first comes within that limit we cannot tell whether it has just now originated or not, and still less can it be known that it did not recently originate below the said limit. As to the peculiar occultness appertaining to the notion of beginning, it is to be observed that the beginning of existence beyond phenomena we can never know either by the senses or consciousness. We can know the beginning and

ending of these phenomena, but no more. In regard to beginnings, therefore, our knowledge is wholly subjective. If we affirm that that which we begin to know, and of which we can find no previous traces, thus absolutely begins to be, our opponent can reply that this may be only owing to our incapacity or ignorance; and so the argument on this side as on the other turns out logically to be only an inference from our ignorance. The two hypotheses are therefore in this respect absolutely on a par. Let both sides agree to be modest, therefore, and make no affirmations on the subject; and if pure logic cannot secure this, let them reflect that the question has not a particle of logical bearing of decisive importance on either theory. The present origination of germs would not necessarily disprove Theism, for God can originate them now as well as in time past. Their non-origination at the present would not necessarily disprove evolution, for nature, as well as God, might in past time do what she does not do now.

§ 13. KNOWN MUTUAL CONVERTIBILITY OF THE
ORGANIC AND INORGANIC, VITAL AND NON-VITAL
SUBSTANCES.

Yet, passing the question of the origination of germs, which involves a subtle metaphysics which philosophy has not yet mastered, there are certain broad and familiar facts which prove that the inor-

ganic does now constantly and everywhere pass into the organic, and the latter in turn into the former. The vegetable world is the product almost wholly of such transmutation. Allowing, for the sake of argument, that in all cases from the beginning there was a seed or germ to start with, yet it is certain that there is to-day organized matter which once did not exist.

Let the acorn be given, and let this be all that is given, as organized matter in the inception of an oak. Now look at it (the tree) at the end of the year, of twenty years. What a difference in magnitude between it and the acorn, besides the innumerable leaves and acorns which the tree has shed. Where has all this vast quantity of organized matter come from? It was not in the acorn at the start. It was not in the sun or air or moisture or earth, for these are classed as inorganic; and if it was in these as organized, then all things are organic and the discussion is stultified. There are but two possible conjectures, that it is an absolute creation, which no one will admit, or that it is the same substances that have existed as inorganic under the name and form of sunbeams, carbonic acid, etc. It is hence absolutely certain that through all the world inorganic substances are passing over into organic substance, and have been doing so for a vast period and to a vast extent.

To a vast extent and for a vast period vegetable substances have passed over into animal substances.

Here, also, we grant that so far as we know seed has been necessary ; but the seed is generally very small in quantity compared with the full-grown animal. And the animal world grows in organized quantity only by the transmutation and organic assimilation of vegetable products, and ultimately of inorganic substances.

Both these classes of organized substances also dissolve and pass again into the inorganic state. That any one in these days should ever deny this correlation between organic and inorganic substances does certainly prove either a marvellous ignorance, or, as Spencer says, an overwhelming bias. If correlation is thus clear so far, and if, as we have seen, both sides are equal in regard to the origin of germs, there is surely hence no small presumption in favor of the correlation between germs and inorganic substances.

This is supposed to be met by the following : " Vitality might be self-generating, it might be transformed physical force, or it might have a source unrecognized at present. Let us grant the absurdity of the first supposition, the previous considerations show the difficulty of admitting the second (sic!) ; there is, then, no alternative but to ascribe it to an *unknown* source. Indeed, why not? There may well be more things in heaven and earth than are dreamt of in our philosophy." Indeed, why not? It was the renowned Captain Cuttle, in the History of Martin Chuzzlewit, whose closing argument and inference

usually was: "If so, why not?" This inference to an "*unknown source*" is precisely the final deduction of Mr. Spencer. The only difference between him and his critic is that his unknown is logically connected with the known as being in essential substance and force the same with the known, while the unknown of his critic is not necessary to the existence of the known, being entirely a foreign being, so that it is logically possible that the known is self-existent and eternal—at least in its unknown nature and mode. We are weary of saying "boomerang," though we find it in every argument we can stop to notice, and we will repeat it no more.

§ 14. DIRECTING AND WORKING FORCES.

Many years ago, in one of his earliest discussions of force in relation to the correlation of forces, Dr. Carpenter made some kind of a distinction between directive energy and other kinds of energy, and he claimed for the former a mysterious organizing and ruling power in the human constitution, a power something apparently like that which is or has been commonly attributed to the soul in relation to the body, and perhaps superior to that. Still he was too vague, as he generally is on pivotal positions, for us to say anything very definite about it. This idea, or something apparently just like it, equally vague, but with far more fulness as well as emphasis of assertion, as is his wont, is here produced by Mr.

Bowne. (P. 96-103.) We will quote from Bowne, because he is more recent.

“The physical forces are the working forces of the system—they are expended in labor and in the performance of function—but the preceding considerations render it impossible to look upon them as the organizing and constructing forces of the system. This organizing force employs the physical as its servants and cannot dispense with them; but there is no proof of correlation.” It is true that there is “no proof of correlation” between working and constructing forces, because there is no proof of any difference between them. Mr. Bowne commenced his treatment of this matter by “*choosing to say*” that “there is a constructive or directive force in the body, separate from the physical forces;” and this is the sum of the “preceding considerations,” which, he says, “render it impossible to look upon them (the physical forces) as the organizing and constructing forces of the system;” and because the impossibility of this distinction is not proved, he assumes that it is true and that “it is impossible to look upon” the opposite theory as true—and it is impossible probably, with him, and many others. On the other hand, we have an equal infirmity in the opposite direction. It is impossible for us to look upon the organizing and working forces as anything more than different phases of the same forces, and we are compelled by our senses and consciousness, whether we choose or not, to affirm not only

the identity of force always, but also frequently the identity of the form, since constructing and directing and organizing forces are always working forces, though working forces are not always constructive and organizing forces.

Besides, these physical forces, these working forces, *are forces*, and they work, it is said, and they are said to "be expended in labor and in the performance of function." We shall agree to this; for we can know forces only in or by their working; and whatever force is expended we suppose it must be "expended in labor and in the performance of function."

But now what comes of the working of this force which is thus "expended"? At least there must be a functionary result from the performance of function; and as the expended force has disappeared in the act of working and expenditure, it has continuously reappeared in this functionary result, unless it has been annihilated, and unless also, on the other hand, this functionary result has been absolutely and miraculously created; according to which we must pronounce all disappearances of phenomena to be the annihilation of things, and all new phenomenal appearances to be absolute and pure creations of things. But as our opponents will not for a moment admit this, they must admit its logical correlative—the identity of physical force with all functional forms and energies. And as there is no form of mental energy which is known except in

connection with these functional forms and energies and the working of said physical forces, they are all logically correlated and identified.

Further, these working forces are by the very phrase announced to be causes, powers. But force has been denied to matter, and that in this is its distinction from mind. These physical forces are therefore mental forces, and the identity of mind and matter is thus proclaimed.

§ 15. ALLEGED DIFFERENT RESULTS FROM THE SAME
GERM-CELLS.

It is alleged "that the germ-cells of many of the higher and lower animals and even of plants, are chemically identical," while a different and specific type of life springs from them. An answer to this is given in the fact that each of these types of life are produced in different connections. To this he replies that it implies that the "*source* of impregnation is a matter of indifference. A mouse might become a man and conversely." This is perversity in the form of dialectical smartness. We all know that all forces operate toward a different result in different connections, and must do so because the product of several forces conjointly must be different from any one separately, and that a change of connection of forces must change results. So must it be here, not because the source of impregnation is indifferent, but precisely for the opposite reason, that the

source is one force and the connections in which it operates are also forces, so that the result is as is the united force and operation. It is true that in those cases where the seed is the same and the products are different, the source is thus far specifically indifferent. But this law has its limits, and the introduction of mouse and man in such a connection is a better instance of misplaced rhetoric than of candor and logic. "If a (*dis*)believer in vitality choose to say" that there is a class of germs which are of such intrinsic nature and force that they will develop into one or other of several different types of life according to the connections under which they are developed, "what is there in Spencer's (Bowne's) argument to disprove it? There is not one word which makes against such a hypothesis; yet he (Bowne) moves on without suspicion that any more proof is desirable." Of course, we shall not be so thoughtless as to repeat his error of supposing that this is any proof of our hypothesis. It is possible, notwithstanding, that a contrary hypothesis is true. But *if it is true* that there is a class of germs which develop into different types of life without any known reason except the difference of connections, then it is also true that these different results are the effect of the intrinsic force of said germs modified by the connections under which they are developed, or they are the result of an unknown power or cause which operates purely arbitrarily without any reason or rational rule and motive, which might and could

with equal ease and reason or no reason do something else with the same seed and in the same connections, in which case there can be here no evidence of intelligence or design. Mr. Bowne is welcome to either horn of this dilemma. We care not which he takes. For ourselves we prefer the former, because it is the least assumptive, and because it only is consistent with itself.

Or he may reject both by rejecting their basal supposition that there are isomeric germs, or germs which have different products though they are intrinsically the same in their chemical quality and in their specific form, and assert that, though they are chemically the same and *appear* to be the same in form, they are of different forms, but that the difference is "below the microscopic limit." On this I observe, that if the form is assumed to be different, though not distinguishable by the microscope, we are equally entitled to assume that the chemical quality is different, though our methods and instruments fail to prove it. Further, if they are assumed to differ in either chemical quality or form as the natural cause and rational ground of the different results, this is perfect evolution. It is just what we contend for, that every specific form is or contains a specific force or quality, and that all changes are the effect of such force in connection with other forces. Whatever argument he can use in this connection is therefore equally good against himself.

Though we have so often seen this destroyer of

evolution "mow off his own legs," and "knock out his own brains," and perform various forms of "lofty tumbling," which elegant phrases are by himself all applied to Spencer, yet we cannot stop to notice a large number of other feats of the same kind exhibited in his discussion of the "Laws of the Knowable." We hasten without further delay to consider some of his objections to evolution drawn from the principles of psychology, where we shall probably see similar feats performed.

§ 16. THE FACTS ON WHICH THE LAW OF CORRELATION IS BASED ALLEGED TO BE NO NEW DISCOVERY.

In entering on a refutation of correlation based on psychology, Mr. Bowne makes light of the supposed discovery of anything at all on this subject. Count Rumford, Mayer, Carnot, Grove, Joule, Helmholtz, and others *have labored in the fire for very vanity*, and the entire scientific world has been under a hallucination in awarding to these men a praise which they have not deserved in the slightest degree. "It is no new revelation that sickness has a depressing effect on the mind; that the various physical stimuli affect mental activity." So we have heard men say that Newton deserved no credit as the discoverer of the law of gravitation, because men had always been familiar with the facts of falling bodies. But in the one case as in the other

there has been exhibited a strength of mind, a patience in experiment and calculation which will always command the admiration of honest and competent minds, whatever be the insinuations and sophisms of special pleaders in favor of effete notions and follies.

§ 17. ON "IFS" AS PROOFS.

In the paragraphs noticed in the last section Mr. Bowne argues that *the admitted facts of the mutual influence of body and mind* are easily accounted for on the dualistic supposition; and on this supposition he proceeds with nine successive eloquent *ifs*: If the soul and body are so and so related, then this correlation would thus far follow, etc., etc., etc. It will be obvious to most other people that we can manufacture as many ifs on the opposite hypothesis of unity, and as this hypothesis and its ifs are simpler and less assumptive they are preferable. These ifs of his are only rhetorical variations of arguments often refuted already.

§ 18. ON SCIENTIFIC EXPLANATIONS.

Physical antecedents, it is reiterated, do not explain sensation, because these antecedents are *so unlike sensation*. Now this same author has elsewhere admitted Spencer's doctrine that a scientific explanation is, not likeness, but classification and reduction to

a law or uniform order. In this sense physical antecedents do explain sensation. If Mr. Bowne had been as candid as he is eager for a dialectic victory, he would have saved himself a great deal of self-stultification.

This explanation is not only the ultimatum of science, but we believe that when our metaphysics is better expounded it will be found that this explanation is the ultimatum of philosophy.

§ 19. ALLEGED INCONSTANCY OF THE CONNECTION
BETWEEN THOUGHT AND MOTION.

It is true that "if there be a correlation between thought and motion the relation must be necessary and constant." But a more flagrant misapprehension of fact and of the doctrine of evolution could not be uttered than is implicitly contained in the assertion that "nine-tenths of the physical antecedents of sensation never produce any sensation at all."

This stultifies itself. For how are these physical antecedents known? Are they known by some other method than by sensation? If they are, we surrender the argument—and everything else, consciousness, philosophy, all. If they are not, the statement is its own refutation.

The significant fact and point of pertinent truth to be noted here is that the same physical antecedents are not always followed by the same mental results. But they are not known as physical ante-

cedents where *no mental* results follow. In the consciousness both must be invariably present or both absent. This is the law of perfect and universal correlation, which challenges proof of any exception, real or possible.

It is true that when the attention is powerfully preoccupied the mind will not be consciously affected by what affects it at other times. This is comprehended in the doctrine of evolution that events operate differently according to the connections in which they occur, so that it would be a reversal of this doctrine to suppose that the same antecedent would produce the same effect on the mind in different states. That attention is required for certain effects is therefore no proof that the soul is an independent automaton distinct from all the forces of matter. And it betrays a gross misapprehension of evolution to say that "the connection should be invariable," attention or no attention, or that the mental result of physical action shall be the same whatever be the previous mental state.

§ 20. ON THE DISTINCTION OF SUBJECT AND OBJECT.

"In every act of knowledge the soul implicitly affirms for itself a separate existence." "In every act of knowledge two things are always given—the *knower* and the *known*—and they are given as *distinct from each other*." Weary of a prolonged exposure of vain dialectic conceits, we shall waste but

few more words. Subject and object, knower and known, are known together and in correlative contradistinction, but not therefore as different forces or substances, else a man is other than himself; for the subject makes itself the object of thought, and the knower is the known, the object as well as the subject of knowledge. If this proves dualism (as he argues at great length, page 158-180), then it proves that the one ego is two different egos, or ego and non-ego.

We had marked thirty or forty other points to be noticed, but we desist, from utter weariness of the disgusting work of destroying small parasites. Mr. Bowne has been commended by his party for an ability to detect and expose the weak points of his adversary. We are not disposed to detract from his merits here. It is generally easier to see the weak points than the strong points of a doctrine that we do not like; and it is still more easy to imagine such weak points, which is all that Mr. Bowne has done in his discussion of correlation and evolution. In reviewing his discussion we have not acted on the supposition that this quality reveals any great merit or any high order of talent. For ourselves, we have sought to attack only his *strongest* points, because we wanted to advance truth, not to gain a dialectic victory. A legion of observed points or pointless paragraphs, infinitely weaker if possible than those commented on, have been purposely left to refute themselves. We have disdained to level our lance at

the *heel* of the modern Patroclus, who exhibits himself in the armor and with more than the airs of Achilles.—Yet we are glad to say in conclusion that Bowne's book exhibits a mental vigor which foreshadows better things in the future—when logical flippancy shall be replaced by sobriety, and when a developed respect for opposing thinkers will induce ability and adequate effort to understand them before he undertakes their refutation.

We have not touched the question of the ne-science philosophy, which is discussed by Bowne, because that has no necessary connection with evolution; and instead of being necessary to evolution, we think it opposed to it, and a radical error, though Bowne knows neither its weakness nor its strength.

CHAPTER XII.

DR. WINCHELL ON EVOLUTION.

THE latest opponent of evolution as a thorough-going system of pure naturalism is Dr. Winchell, late Chancellor of the new University of Syracuse. Winchell is an able man, and his book on Evolution is scholarly and courteous, though he often blandly preaches where he ought to give us philosophy and logic, while his sapient tone will be quite assuring to those who need such aid. We will note such of his strongest points as have not been previously covered by us, and such as may deserve another touch.

§ 1. A QUESTION OF FACT AND OF THE METHOD OF
DETERMINING SOME FACTS.

He objects first that we have not "a single instance of the derivation of one good species." He affirms that all parties agree in this. We demur to this statement; and as he only affirms, we may justly be content here with our demurrer. But we observe further that his assertion is unwarranted because the chief terms of his affirmation are of doubtful and dis-

puted meaning. Let us be agreed on what is derivation and what is a good species, and then the determination of the derivation of species will be in a way to be settled. With our view of species we consider derivations of good species to be by no means unknown in the floral kingdom. For instance, we understand that cabbage, cauliflower and kale have the same origin, and we consider them different "good species."

Among fauna the derivation of good species may not be so easily proved, because the chief point of dispute is on the fact of derivation. What appears to one party a sufficient proof of natural derivation does not so appear to the other party. We are agreed that the lower fauna preceded the higher. We differ on the question whether the latter are the natural product of the former or whether the latter have in addition a supernatural cause. If the doctrine of a pure naturalistic evolution is true, then the progressive changes from the eozoön to man are all exemplifications of the natural derivation of good species. If this doctrine is in every stage an error, then there is not "a single instance" of such derivation. Dr. Winchell's assertion is true or its contrary is true according as naturalism or supernaturalism is the true philosophy. This therefore is the question to be settled. And as we have already seen that nature cannot reveal the supernatural, naturalism or evolution pure and the natural derivation of all species is a necessary inference from the facts of

paleontology. Allowing that species have, as is affirmed, been for a very vast period unchanged, so that we have never observed an actual birth of one species from another, yet we know that species have changed, that is, that new species have been successively originated, and we know that natural forces have operated in their production, while we do not know that natural forces are in all connections incompetent of themselves to produce them, so that we have no proof of, or ground for inferring, any supernatural agency; and so we are obliged to consider that we have a *philosophical knowledge* of the natural derivation of good species. That paleontology shows there are, as he pleads, "numerous instances of persistence of types," proves nothing, because we also know that paleontology reveals numerous *changes* of types; and neither change nor permanence proves their cause to be supernatural; as neither of them bears on the question at all.

§ 2. GAPS AND BREAKS AGAIN.

Like Dawson and others, he next presents a series of "gaps" and "breaks" of interminable width and fathomless depth for evolution to fill, and which without further concern we will leave darkly yawning.

§ 3. GRADUALISM AND EVOLUTION AGAIN.

Apropos of these gaps, he demands and assumes that evolution shall be by infinitesimal gradations.

an assumption charged by Dawson on evolutionists exclusively, and that the primordial types shall be the lowest possible; but when this last demand is met in the Eozoön Canadense, he doubts whether this is an animal; and if its animality were more pronounced or conspicuous, he would have demanded a lower form for the first, as the context clearly shows.

§ 4. ALLEGED OPPOSITION OF SOME PHYSICAL
INFLUENCES TO ORGANIC RESULTS.

The foregoing objections are said to be "from the field of facts." He now proceeds to ply evolution with objections "in the field of physiological forces." The reader will observe that physiological forces are allowed. His first objection here is as follows: "*The action of physical influence is often, if not always, against the development of the organic modification which appears in correlation with it.*" This is designed for a careful and profound utterance, and two pages are employed in its elucidation and confirmation. Thus, the "action of physical influence" in gravitation naturally tends to shorten an animal's legs, but in spite of this the legs of a giraffe grow very long. This result, he says, is "not produced by any known physical force;" and he hence infers that the long legs of the giraffe, and all other things which are attained in opposition to a known physical force, are the product of "some force which is superphysical." This is marvellous

logic! Is there no physical force except the law of gravitation? And is every unknown force, or rather, every force which we have not yet specifically defined and named in contradistinction from all other forces, necessarily superphysical? Is it not as familiar as the alphabet that all nature operates only by the interaction and counteraction of various forces; and that all organisms are the equilibrated results of such operations? Is it by a superphysical force that, contrary to the force of gravity, the sap ascends the tree and that the tree grows ever larger and higher; and that the mountain rises from the ocean bed and rears its head above the clouds? Is it by a superphysical force that the heart sends the blood rushing to the brain, or that the projectile is hurled through the air from the mouth of the cannon? It is true that there is some physical influence which antagonizes the organic development in correlation with it; but it does not therefore follow that this organic development must be the product of some superphysical force. It only follows that some other force or forces, physical or superphysical, must antagonize and utilize this. And as it is in this mutual antagonism and utilization that all physical forces operate, his principle justifies no inference except that in all organisms some forces are antagonized and overcome by other forces.

The ex-Chancellor here not only argues badly, but he makes wild assertions as to facts. It is admissible to say that *some* physical action opposes organic

development in some directions ; as gravitation certainly tends to shorten an animal's legs. But it is not admissible to transform this particular judgment into a universal judgment, so as to say that "*all* physical action opposes organic development." Winchell rather shrinks from saying this at the outset, and only says, "often *if not always*." But on the next page he gets over this caution, and in relation to the evolution of "organs in any stage of development," he says: "The physical influences, strictly speaking, are *GENERALLY opposed* to the result." If this be true, then Winchell's God has made and endowed nature and marshalled her force to operate against His plans, and instead of using nature he simply nullifies or reverses her forces. Thus every organism is an absolute miracle, the product of pure supernatural agency without the aid of and in opposition to all natural forces ! If he is willing to hold to his own doctrines when he understands himself, he is welcome to this. By way of strengthening this hyper-supernaturalism, he tells us that correlative accompaniments or antecedents are not *causes*, but only *conditions* of the result. We have seen this before, and shall find it again as we proceed. It is singular, however, that there should be the action of physical forces and physiological forces without physical or physiological causation ! What kind of force is that ? Will the learned Professor explain ?

§ 5. ON THE APPARENT VARIATIONS IN PHYSICAL
OPERATIONS.

“Another general principle indicating *that the efficient cause of organic modifications is hyperphysical*, is the fact that *very specific physical influences are not always, nor even generally, accompanied by such modifications as are in parallel cases attributed to them.*” An elaborate statement of the simple sentiment that apparent parallel physical forces are often followed by different results. We admit this proposition to be a truth, and as trite as it is true. What then? Shall we say that the different results are always owing to some hyperphysical and supernatural force, or to our false estimate of the forces and results compared, or to some natural law known or unknown? There is a parallel, he says, between man and monkey in that both like cocoanuts. They ought, therefore, to have the same power to travel trees and gather nuts. But as they have not, the difference is to be ascribed to supernatural agency. Now, if man were like the monkey in every other taste and faculty, it might properly be expected, though it would not be a logical necessity, that he would be like the monkey in his nut-gathering faculty. Man’s developed brain, however, can dispense with the ape’s form, and can use the ape or other instruments to get his nuts, while his different form subserves higher ends in consonance with his brain.

Man has a better power of gathering nuts than the ape, a brain power. Because man has transcended the ape it does not follow that according to evolution he should have no taste in common with the ape except so far as he has the same form. Nature, it is supposed, makes partial changes and progressive changes, changes in some points without any changes in other points, preserving some parallels while destroying others. This is a fundamental doctrine of naturalism and evolution; and the argument in question is an *ignoratio elenchi*, besides being intrinsically a non-sequitur. Because a man has some tastes in common with the infant, it does not follow logically that his peculiar virile powers are of supernatural origin; nor does it follow on the principles of evolution that because of their likeness in this respect, they should be alike in all other points.

§ 6. THE SAME PRINCIPLE DIFFERENTLY EXPRESSED.

“We should remark further that *the same physical influence is often accompanied by profoundly differing organizations.*” This is a complement to the preceding principle. There he argued that according to evolution where there is a parallel in one point there should be a parallel in other points, which equally contradicts evolution and common sense. In his illustrations of this latter principle he argues on the similar false assumption, that evolu-

tion requires that what is alike in some respects should not be unlike in other respects. Animals that are alike in being apterous, whether insect or vertebrate, should all or neither become winged, and that as some do and some do not become winged, evolution is incompetent and supernaturalism is necessary. Nothing could be more superficial as a principle, more illogical as an argument, or reveal a more inane misapprehension of the doctrine of evolution. Evolution holds that where every antecedent and concomitant are the same the consequents will be the same; but that a difference in any essential particular in the former necessitates a difference in the latter; and hence as there are many essential points of difference between an apterous insect and an apterous vertebrate, they must develop or evolve different results. Of equal force and significance is his comparison in this connection of the structure of the wings of birds, bats and insects. He argues that as the end of all is the same, namely, flight, nature would construct them all on the same plan; but as they are not so constructed, they are the product of supernatural agency. If all the preconditions and forces and connections were the same, nature would certainly construct the wings alike, not otherwise. If Dr. Winchell can prove that these three different styles of wing originated where there were in operation only exactly the same kind and combination of natural forces and in "the same region and under the same set of circumstances" exactly, he would

deal a fatal blow to evolution. We await his achievement of this feat.

§ 7. A SPECIMEN OF METAPHYSICS IN A DEFINITION
OF PHYSICAL CAUSE.

Dr. Winchell next opposes evolution by a series of "Objections in the Field of Metaphysics." He opens this subject as follows: "A physical cause is a definite quantity and can produce but a definite and uniform result; but the series of organic forms is a progressively varying result." This has certainly all the characteristic merits of metaphysics as metaphysics are conceived by the popular mind; for it is sufficiently vague and vacuous. "A physical cause is a definite quantity and can produce but a definite and uniform result." This is no doubt true. But it does not define physical causes. All causes are definite quantities, and all results are definite, though they may not be definitely known to us. Nor does a physical cause operate any more uniformly than a mental cause. Intellect operates with as much regularity as gravitation; and did we perfectly know the force and conditions of any intellect we could determine thus far its action and result as certainly as the velocity of a falling body. To a very large extent also the will is certainly uniform in its operations, so that could we know the temperament and disposition and inner history and relations of any mind we could predict with proximate, if not perfect-

certainly its volitions. A large number of the most able and cultured divines of the evangelical church have held that the action of the will in all men is as uniform as the laws of external nature. This *must* be so of the will of an *infinitely perfect Being*, who cannot but act uniformly, though He may be supposed to change some of nature's laws; and with Him the same volition must be followed by "a definite and uniform result."

§ 8. ANOTHER SPECIMEN IN A PETITIO PRINCIPII.

But while all causes, physical or hyperphysical (unless we except the Infinite), and all effects, are definite quantities, it is only from experience in any case that we can know the degree of this quantity and what is its kind or nature. That "the series of organic forms is a progressively varying result," does not prove that this result is not a *definite* and *uniform* result relatively to its causes or that its causes are not physical in the sense of being purely natural (for the dispute is only between naturalism and supernaturalism). The *causes* of this progress are the point in debate, and the question requires a philosophical determination. It is alleged that in the production of this result we see the operation of a force which "has behaved as no material force has ever been known to behave." This assertion begs the question, because whether this is so or not is the

point at issue. Doubtless the author had a vague idea that this force is not known to behave so *anywhere else*. True, because that is impossible unless we had the history of another world in its progress through the same changes. That we do not see nature's force now producing changes such as we know occurred in the past is nothing to the point, for if it had done those things in the past it would not, *ex hypothesi*, repeat them now.

§ 9. ON PROGRESSIVE AND CYCLICAL MOTION AND
PROVISION FOR THEM IN NATURE.

"In the field of physical forces," he tells us, "we find no *provision* for indefinite progression, but only for movement in cycles." "The circle of the waters from the ocean through the clouds to the ocean again" is quoted as a known physical cyclical operation in contrast with the "indefinite progress" from chaos to cosmos and from mollusk to man. But the latter is not a case of *indefinite* progress. It is a line with two known termini; and moreover it is manifestly all a part of an incomplete cycle. All physical life must perish, and cosmos must end in chaos. Only in its duration and complexity does this cycle differ from "the circle of the waters from the ocean through the clouds to the ocean again."

§ 10. NATURAL SELECTION NOT COMMENSURATE WITH
EVOLUTION.

Dr. Winchell everywhere confounds evolution with the special and peculiar idea of Mr. Darwin concerning natural selection. Natural selection may not be adequate fully to explain the evolution of species. We have never supposed it is. It is only one of innumerable forces, and too much influence has been sometimes attributed to it. But its inadequacy for everything is no disproof of evolution. Evolution embraces *all natural forces*, known or inferred, measured or unmeasured, defined or undefined. That "there is an incongruity between natural selection, viewed as a force, and the results attributed to it," is therefore of no consequence whatever in relation to evolution. If he can prove that there is an incongruity between *all nature's forces* and the results attributed to them by evolutionists, he will have an argument against them. But this he cannot do, because he knows nature's forces only by the results, and the point of debate is whether all known results are or are not results of natural force. The evolutionist argues that they are, because they are themselves natural forces in uniform connection with the totality of nature; because natural force is well known while a supernatural force is unknown; and because the inference from nature to the supernatural is illogical, while the inference from nature to

nature is both logical and all that is logically necessary, and involves an infinitely less assumption than supernaturalism.

§ 11. CAUSES AND CONDITIONS, OR THE ALLEGED
PRIME FALLACY OF CONSIDERING NATURAL
SELECTION AS A CAUSE.

“But the deepest fallacy of all is the assumption of natural selection *as a cause*.” “Physical influences” are not “efficient causes,” but only “conditions” or “conditioning causes.” Passing the logical mystery of a physical influence which is not a physical cause, we observe that if nothing physical and natural is an efficient cause, then all force is hyperphysical and supernatural; and all nature is useless, because it does nothing; for if it does do anything, it is a cause, an efficient cause; and if it is not efficient it cannot be known as a condition or conditioning cause, because that is to know it as determining and controlling and so causing the action of Deity which is a very lofty form of causation. If some things in nature are causal and others are not but only conditions, we can discriminate them only by their results, and their results can be discriminated only by their uniform connections; and as the uniform antecedent and subsequent must be considered respectively cause and effect, and as contingent connections are not conditions, there is no possible discrimination between efficient natural causes and conditions or conditioning causes, as before seen.

§ 12. SELECTION AS AN ACT OF MIND.

It is affirmed that "selection is an act of *mind*." Yes, where there is a *mind* in his sense of the word. We suppose that it was his mind that made selection of his topics and arguments. But does Dr. Winchell never appropriate a word that expresses an act of mind to describe brute action or organic unconscious action? He would not raise any issue with any one who should describe the liver as selecting the chyle from the mass of the pulp presented to it, as its separation of the chyle from the innutritious or poisonous substances with which it is connected bears a striking resemblance to an act of volitional selection. The same is true of animal preference of beauty and strength in mating; and we often say of flora that they prefer or like such or such localities and climates. Why then should the mind of Winchell demean itself by selecting a *word* for an antagonist, assuming that he is fighting an *idea*? Besides, Mr. Darwin admits that in all animal selection there is the action of mind. All evolutionists also admit this and much more, attributing mind to all matter. They differ from Winchell only in their notion of the nature and origin of mind.

This closes the list of Winchell's objections to evolution. He treats in conclusion of the bearing of evolution on Theism; but as all he says is answered in our previous discussions we pass it by.

§ 13. ON STICKING TO SOBER FACTS AND TO
SCIENTIFIC METHODS.

Winchell's last sentence is as follows: "For us, we persist in thinking that science ought to maintain itself strictly within the sphere of observed facts, and rest completely independent of every theory which would tempt it into the sphere of imagination." This very sapient sentence deserves the honor of a prolonged salaam with many guns. Did its force and authority make it worth while, men of science who advocate the doctrine of thorough naturalistic evolution, which Winchell opposes, would be justified in indulging a little indignation at the serene insinuation that their doctrine and its proofs are all the products of "the imagination," without any support from "facts," while he, it is supposed, adheres to facts so soberly and with most exemplary and rigorous and scientific self-control. If his own logical faculty were not rendered comatose by his theory of supernaturalism, he himself would see that his supposed facts, so far as he differs from his opponents, are only assumptions or inferences, the refusal to accept which without some reason and against all reason necessitates naturalistic evolution. What are the known facts? The existence and operation of known natural forces in known natural phenomena: That the universe of nature, whether internal or external, directly presents us with this cannot be

questioned. So far all are agreed, and here opposing parties begin to form in taking the next step—in their inferences from the known to the unknown. Neither party, nor any party, confines “itself strictly within the sphere of *observed* facts.” To make this a requisition of science is absurd, for then there would be no room for a disciplined deduction or induction, which are the characteristic processes of science and philosophy in distinction from simple perception. Science, therefore, according to its universal acceptance, goes beyond, not facts, but beyond *observed* facts, by induction or by deduction. If the process is a strict and perfect deduction, the result is *knowledge* by logical demonstration. If the process is an induction the result will be a theory, and theories may vary infinitely in the degree of their probability. All theories, therefore, go beyond *observed* facts, but always with a supposed reason based on observed facts. Such theories are held and maintained and practically acted on by Winchell. The greatest and grandest of all possible theories is the doctrine of an Infinite Personality. He bases this theory on observed facts, from which he infers this Infinity as their Cause. “It seems to me,” he says, “that life could not have come into existence, and been successively and progressively evolved as it has been, unless it have an infinite personal Cause.” This is all his argument, reduced from the gaseous to the solid, tangible state. The more logical evolutionist admires his sublime conception of

Deity, but as he knows nothing of causes except from what they do, and as he knows nothing of what they do except by their effects, and as he knows their effects only by their uniform connection in time, he has not the slightest reason for any assumption or inference except that the precedent phenomena of nature contained all the force which is manifest in all the subsequent phenomena of nature, unconscious or conscious. This is the smallest and most modest inference he can make, while Winchell's inference is an unscientific and illogical leap from the finite to the Infinite, and from nature to the supernatural, and an infinitely larger inference than the observed facts necessitate. If the evolutionist is incompetent to the achievement of the self-contradictory feat of confining his "science" and his "theory" "strictly within the sphere of *observed* facts," he travels beyond these familiar bounds no more than he is absolutely obliged to do; and when he does go beyond, it is only to forces of the same kind as those that are known in the observed facts—nature-force. It is not his "imagination" which sends him thus far or which stops him there, but his logic and common sense, in the use of the same principle which he uses everywhere else, according to which he always makes the smallest possible inference that will explain the facts, and infers only forces of the same kind as he sees operating in the observed facts. If the supernaturalist can only be by some means enabled to understand the philosophy and logical

procedure of evolution, he will see the necessity of inventing some other method and point of attack than those which have hitherto been practised. The method by which evolution has attained its conclusions, purified as it is in these pages from extraneous matter, is evidently invulnerable. Nothing remains for the Theist but to find some way of proving his own doctrine while admitting the logical and philosophical procedure of evolution and at the same time incorporating and assimilating its results with his own doctrine. Le Conte has made a commendable effort at this, though none of his readers probably feel entirely satisfied with the result.

CHAPTER XIII.

INVOLUTION.

§ 1. INVOLUTION AS CORRELATIVE OF EVOLUTION.

EVERY thought and every definite term has its antithesis or correlative. The correlative of evolution is involution. These are not correlative as thoughts or terms merely, but as forces. Both forces exist and operate. Evolution creates coherent definite heterogeneity. Involution creates simplicity and homogeneity. Spencer designates the process of involution by the term dissolution. But this is too general in its use and meaning to be of the best service in this connection. Involution, besides being the exact antithesis of evolution, has the merit of not being preappropriated by an indefinite variety of popular uses.

§ 2. EQUILIBRATION DEFINED IN RELATION TO
EVOLUTION AND INVOLUTION.

These two opposing forces produce the equilibration of forces, or the balance of integrated forces. Equilibration is to be discriminated from evolution

and involution only in this, that it cannot be identified with either separately. It is the tendency and results of both in their counter action. All motion, all existence is an equilibration between the forces of evolution and involution; because these two latter are everywhere and always operating and counteracting, and they form the supreme genus of nature's forces. Evolution tends to multiply, and involution to diminish, the elements of matter; and the number of these elements at any time is the equilibrated result. Evolution tends to create and multiply, and involution to oppose and destroy, material organization, and the cosmos is the equilibrated result. Plant life and animal life and all life that we know are the equilibrated product of the same counteracting forces. Evolution differentiates, feeds, supplies, heals, while involution wears away, decays, and finally dissolves the structure and life. Equilibration is not therefore any special and better product of evolution, and equilibration is not confined to times or places; because whatever is is what it is as the equilibrated product of evolution and involution.

§ 3. EQUILIBRATION IS UNSTABLE.

The bright prophecy, therefore, with which Spencer closes his chapter on equilibration, is without foundation or meaning. Evolution may for the present and the indefinite future be in the ascendant, and it will certainly operate so long as there remain any forces unbalanced; and that will be forever,

because of "the instability of the homogeneous" and the constant operation of involution creating the homogeneous. Absolute and universal equilibration in the sense of an absolute and universal and unchanging balance of integrated forces precluding all further distribution and redistribution of material forces, can never be attained. Besides, that state, if attained, would be a state of universal death, of petrification and eternal darkness and frost. Spencer has no warrant for the belief that evolution "can end only in the establishment of the greatest perfection and the most complete happiness;" because it cannot "end," and its end, if that were possible, would be the end of sentient existence.

Wherever evolution operates, nature's forces are divided, since each motion is followed by more than one other motion, while the plurality contains only the same amount of force that was contained in the antecedent. Evolution always tends toward involution by indefinite division till differentiation is inappreciable and proximate homogeneity is attained; and it is always creating motions which it cannot use, and these are appropriated by involution. Though evolution is now in the ascendant and a progressive equilibration is probably before us for an indefinite period, yet the time must come when by endless differentiation and division evolution has greatly spent its force and become dissipated in a homogeneous mass, and involution must again for a season be in the ascendant.

We see also the conspicuous operation of involu-

tion in the constant decadence and dissolution of animal and vegetable life ; in the universal tendency to decay and disintegration of all organisms from the highest to the lowest ; in the gradual wearing down of the mountains and the encroachment of the sea upon the land ; in the constant loss of heat by our solar system, and the probable cooling and contraction of our solar luminary. These changes must eventually destroy all life from our planet, and the sun, gradually diminished by his own fire, and perhaps broken up into many pieces by unequal cooling, will proportionately lose his power of attraction, so that his satellites will fall off from him and recede till they will probably strike against each other or against other bodies and be heated to fusion and become mingled together in an incandescent mass, and perhaps in that state may be brought into contact with what may remain of the sun and again fuse that body into its original state.

Or perhaps by the operation of the tides and atmosphere and lunar attraction the motion of the earth in its orbit will be gradually retarded till its tangential force is destroyed and it falls into the sun, just as meteors fall into the earth ; or by similar forces some other and larger planet may thus fall into the sun, destroying the solar equilibrium and precipitating the dissolution and involution of our entire solar system. Exactly how this complete cosmic involution will be effected it is impossible to predict in detail. But come it will. Evolution must run its cyclical race and old chaos must return.

Homogeneity once more attained, the same unchanging force must start afresh on its process of evolution, and run its course to a similar issue. This is nature's cycle, which, so far as we can learn from her own disclosures, she has been repeating from eternity, and which to all eternity she must continue to repeat. The duration of each cycle no one can ever know, for some of the marks of successive time must always be wanting or be dubious; and each cycle must be utterly ignorant of every other; so that what preceded or what will succeed ours we can never know. But we know that the cycles will be alike or different according to their elemental combinations, and neither these nor their results can be anticipated. We clearly see, however, that nature's cycles must essentially be eternally the same, because nature's force is eternally the same, whatever be the possible variety of new combinations and specifically new evolutions. In any case, whatever her variations in these respects, we have thus, on the theory of absolute evolution, the certainty of an endless repetition of chaos and cosmos without any certain progress or known plan or forethought. The homogeneous is always evolving heterogeneity; and heterogeneity is always generating homogeneity by involution. Evolution and involution operate only by mutual counteraction and interaction, so that they are coeval. Hence an unchanging equilibration is impossible; and the instability of the heterogeneous is as indubitable as that of the homogeneous.

CHAPTER XIV.

ANALYSIS OF SPENCER'S DEFINITION OF EVOLUTION.

§ 1. SPENCER'S IDENTIFICATION OF EVOLUTION AND PROGRESS.

MR. SPENCER'S brilliant but hasty generalization has identified progress with evolution, and so has given us a very novel exposition of the notion of Progress. His object in this is to meet an objection to evolution that may possibly be derived from the notion of progress generally accepted. According to his theory evolution is the highest form of the activity of all known or conceivable force, whence it logically follows that it is the highest and the only conception of progress; and evolution (as discriminated from dissolution, or, more comprehensively, involution) is always a process of creating or increasing definite and coherent heterogeneity, so that on this basis the same must be true of the notion of progress. It will follow that if this notion of progress is untenable, this notion of evolution (that definite, coherent differentiation is the highest known or conceivable form of the operation of force) is also untenable. Hence his immense and elaborate endeavors to establish this notion of progress, filling

one good-sized volume preliminary to his philosophy, and then supplemented in the first volume of his philosophy proper.

But we have only partially given his definition of progress, or evolution. In order to be fair and clear and thorough we must give it fully and in his own words. It is this: "Evolution is a change from an indefinite, incoherent homogeneity, to a definite, coherent heterogeneity; through continuous differentiations and integrations." (F. P. p. 216.) While increased complexity is essential, it is not every kind of complexity that constitutes progress. The special complexity in question is discriminated from all others by two marks which he gives—"definite and coherent."

§ 2. TAUTOLOGY OF THE SECOND MEMBER OF THIS
DEFINITION.

He says "this is attained through continuous differentiations and integrations." This *modus operandi* we will concede at once, because an increase of definite, coherent heterogeneity analytically implies continuous differentiation and integration, and they are only different phrases for the same idea and process; and so the latter part of the definition is entirely unnecessary and tautological. He might have said: "Evolution is a change from an indefinite, incoherent homogeneity, to a definite, coherent heterogeneity;" or: "Evolution is a continuous differ-

entiation and integration." These are synonymous, and each alone is as complete as both together.

Spencer had a partial or proximate perception of this point. He says: "It may perhaps be remarked that the last of these clauses is superfluous, since the differentiation and integration are implied in the first clause. This is true: the transition which the first clause specifies is impossible save *through* the process specified in the second. Nevertheless a mere statement of the *two extreme stages* with which Evolution *begins* and ends, omitting all reference to *changes connecting them*, leaves the mind with but an incomplete idea. The idea becomes much more concrete when *these changes* are described. Hence, though not logically necessary, the second clause of the definition is practically desirable." But it is to be observed that our criticism is not merely that the first clause "*implies*" the second and so makes the latter needless; but that the first *is* the second, the difference being only verbal, that the conception of either *is* the conception of the other, that each implies the other and includes the other only as a thing implies and includes itself.

Hence we do not admit his admission, that "the transition which the first clause specifies is impossible save *through* the process specified in the second;" for this implies that there are two processes, which we deny. Increasing definite coherent heterogeneity *is identical with* "continuous differentiations and integrations;" and the latter are not, therefore,

as he intimates, the “changes *connecting*” “the two extreme stages” of homogeneity with heterogeneity, or small heterogeneity with greater heterogeneity. Through all, or rather *in* all, stages the so-called two processes are one. It is self-contradictory to suppose that there is any connecting link or anything whatever *between* homogeneity and heterogeneity, or between less and greater heterogeneity.

§ 3. TAUTOLOGY OF THE WORDS DEFINITE AND INDEFINITE.

The words definite and indefinite have, in this connection, no distinctive force, and so they are tautological; for all homogeneity is indefinite, and all heterogeneity is definite. The conception of the former analytically includes indefiniteness and excludes all distinction and definition; while the conception of heterogeneity, the logical counterpart, implies the contrary. His definition would therefore contain exactly the same idea if these two correlative terms were omitted. They also do great harm, as they induce the reader to think they are an addition in thought, in which case they are confusing and misleading; and it is very clear from his discussion of the subject that Spencer thought them of important specific significance, which he unfolds at great length. They therefore originate in and tend to perpetuate a hazy indistinctness of thought, swelling a very simple idea into gaseous dimensions and volatility.

§ 4. IRRELEVANCY OF THE WORDS COHERENT AND
INCOHERENT TO HOMOGENEITY.

The correlated terms, coherent and incoherent, are open to still more serious objections. They are entirely irrelevant to their connection. Coherency and incoherency do not belong respectively to heterogeneity and homogeneity, as this definition implies that they do. Both belong to heterogeneity, but neither of them belongs to homogeneity. Perfect homogeneity cannot be incoherent, for incoherence, as well as coherence, implies difference and differentiation; for what coheres integrates and differentiates, and what does not cohere integrates because it separates and differentiates; so that both coherence and incoherence belong to differentiation and heterogeneity, while neither belong to absolute homogeneity. Incoherent homogeneity is a contradiction in terms, just as coherent homogeneity is also, because both adjectives imply complexity while the qualified substantive excludes complexity.

This is not merely a verbal blunder, which in some sentences could be pardoned and passed in silence, while in this it cannot. It is the violation of a logical law so obvious and so constantly acted on, though perhaps never distinctly enounced from its very familiarity, that it is a fault of the gravest kind in the most central sentence of a work so pretentious, elaborate and able. The law is that both the quali-

fying correlatives are always applicable to the same substantive object or subject. Each correlate may be applied to a different subject, but both are always applicable to the same one subject. Thus it may be predicated of the *same* man or of different men, or of man and of animals, that he or they are kind or that he or they are unkind. They must all be one or the other and *they may be either*. But homogeneity, which is simplicity, can be neither coherent nor incoherent, though heterogeneity may be either; so that while these two correlatives belong to heterogeneity they cannot be used at all in reference to both heterogeneity and homogeneity; still less can they be separated and one applied only to one and the other only to the other. These two qualifying correlatives must therefore be thrown out of the definition; which will now stand in consistent simplicity as follows: "Evolution is a change from homogeneity to heterogeneity." This is all that his entire sentence says, though it contains many more words, large words, laboriously collocated, but either self-contradictory or tautological.

We have given his definition of evolution or progress this brief analysis because it is the seed-life of all that is distinctive and characteristic in his philosophy, as he himself plainly intimates at the outset; and it ought to be able to bear the most rigid examination, both from its importance, and because, though not long, it is the most elaborate sentence man ever wrote, being the result of years of labor, and only

perfected after a part of it had been long before the public.

At first, progress or evolution was the change only from the homogeneous to the heterogeneous; then the correlative epithets, definite and indefinite, then again coherent and incoherent, were added. (See p. 214, § 57.) The writer published a criticism of it as it first appeared, and it appears from the above analysis that it is still open to the same criticism as then, since the additions are unmeaning or irrelevant. We shall, however, discuss it on the supposition that these additions mean something, so as to give the author whatever advantage they may afford.

CHAPTER XV.

ANALYSIS OF SPENCER'S PROOF-FACTS IN SUPPORT
OF HIS NOTION OF PROGRESS.

THIS makes it necessary that we be agreed on the meaning of these two marks, definiteness and coherency, or at least that we show sufficient reason from his writings for the view we take of them or the meaning attached to them in our discussion. On the first mark there can be no possible mistake, if we know what homogeneous and heterogeneous are; for the latter is always, the former never, definite; and so we must always allow that where there is a change from the homogeneous to the heterogeneous there is a change from the indefinite to the definite, because the two processes are one. We allow that what he calls the *two* processes do take place. We agree as to the concrete fact, and we only differ respecting its analysis.

§ 1. . A SPECIMEN PARAGRAPH.

In view of his extensive array of exemplifying facts we shall perhaps be accounted flippant or suspected of failing to comprehend him unless we controvert some of these alleged facts and expose a

little more fully his process and his erroneous analysis and consequent misstatement of facts. We will therefore quote one of his most important pages on this topic and then bestow upon it a brief analysis. (1.) "In the process of development, no matter what sphere it is displayed in, there is not only a gradual multiplication of unlike parts; but there is a gradual increase in the distinctness with which these parts are marked off from each other. (2.) And so is that increase of heterogeneity which characterizes Evolution distinguished from that increase of heterogeneity which does not. For proof of this it is only necessary to reconsider the instances given above. (3.) The structural changes constituting a disease have no such definiteness, either in *locality*, *extent* or *outline*, as the structural changes constituting development. (4.) Though certain morbid growths arise much more commonly in some parts of the body than in others (as warts on the hand, cancers on the breast, tubercle in the lungs), yet they are not confined to these parts; nor when found on them are they anything like so precise in their relative positions, as are the normal parts around them. (5.) In size again they are extremely variable—they bear no such *constant proportion* to the body as organs do. (6.) Their forms, too, are far less specific than organic forms, (7.) And they are extremely irregular and confused in their internal structures. That is to say, they are in all respects comparatively indefinite. The like peculiarity may be traced in decomposition.

(8.) That state of total indefiniteness to which a dead body is finally reduced, is a state toward which the putrefactive changes have tended from their commencement. (9.) Each step in the destruction of the organic compounds is *accompanied* by a blurring of the minute structure—diminishes its distinctness; and step by step the lines of organization, once so precise, disappear.” (F. P. p. 177.)

We must be as brief as possible in our examination of this extract, and we shall omit many points which if developed would render our exposition more lucid and forcible, but too long.

§ 2. A TAUTOLOGY.

(1.) The “multiplication of unlike parts” and “the distinctness with which these parts are marked off from each other” are one. There are no parts which are not marked off from each other, and they are parts only as being and because and so far as they are marked off from each other, for this is the notion and meaning of parts; so that these supposed two processes are one, and for this reason they always go together.

§ 3. ALL INCREASE OF HETEROGENEITY IS EVOLUTION.

(2.) Number two is thus nullified, as thus there is no increase of heterogeneity which does not charac-

terize Evolution, for if these two are one, and if either characterizes evolution, both do always.

§ 4. A MISTAKE AS TO FACT.

(3.) What is the evidence that "the structural changes constituting a disease have no such definiteness, either in locality, extent or outline, as the structural changes constituting development"? It is a mere assertion of what appeared to him as a fact. But his unparalleled and superfluous energy in multiplying illustrations seems sometimes to prevent him from stopping to get a clear and definite view or even logical conception of his supposed facts before he asserts them. Now all physical facts and changes can exist or occur or be known or conceived only so far as they have or are supposed to have some definite locality, extent and outline. The contrary supposition is self-contradictory, because all such facts and changes are supposed to occupy some time and space, so that their locality, extent and outline are all necessarily and equally and perfectly determined and definite, though intrinsically they may be perfectly simple and homogeneous. This is the analytical statement of the fact objectively. Subjectively also cognition, determinateness and definiteness go together. What is perfectly and absolutely indefinite subjectively is subjectively nil; and it is only definiteness and relative definiteness that is or is knowable or conceivable; and nothing is

known except so far as its definiteness or determinateness is known, whether it be development or disintegration, and one class of processes is just as definite as any other, though some, because of their simplicity and fixedness or other causes, may be more easily traceable than others.

§ 5. A MISTAKE AS TO THE LOGICAL BEARING OF
A FACT.

(4.) That "morbid growths are not confined to these parts" where they are found, is nothing to the point. That does not take away their definite locality, extent and outline so long as they are there, for while they exist, they are where they are, and what they are and of just what form they are.

§ 6. ANOTHER MISTAKE AS TO FACT.

The assertion that they are not "so precise in their relative positions as are the normal parts around them," has been refuted in paragraph number three; where it is shown that all physical facts are equally and perfectly "precise in their relative positions," and are only known so far as their precise relative positions and forms are known.

§ 7. ANOTHER MISTAKE AS TO THE LOGICAL
BEARING OF A FACT.

(5.) That they are extremely "variable" whether "*in size*" or anything else, proves nothing of their

indefiniteness, any more than the mobility and varying sizes of men prove that there is nothing definite in their locality and size. The definiteness even of bubbles is unaffected by either their size or their short duration. We cannot describe their size and locality in general terms, not because they are indefinite, but because of the multiplicity, diversity and varying definite forms of this definiteness. We know variation of any kind only as we know varying definite forms. Destroy the latter, and we destroy both ; for they are one.

§ 8. ALL DISTINCT FORMS ARE EQUALLY SPECIFIC ;
OR ANOTHER MISTAKE AS TO FACT.

(6.) Equally false is the assertion that “their *forms*, too, are far less specific than organic forms.” They may be less highly organized, less differentially integrated in their internal parts ; but their form is not the less specific because it is what it is instead of being some other form, whether internally or externally ; and it is only because its form is perfectly specific and so far as it is specifically known in contrast with others that it can be discriminated from others.

§ 9. A VERBAL ERROR ; OR IRREGULAR IS NOT THE
SAME AS CONFUSED.

(7.) The assertion that “they are extremely irregular and confused in their internal structures,” seems

to identify irregular and confused. But irregular implies definiteness—plurality and discriminated forms and relations of parts; and so when these are added to the usual organs they give an increased definite heterogeneity to the body; and, in the case of warts, wens, hoofs and callosities, they have no evident tendency to disintegrate the system.

§ 10. STILL ANOTHER LOGICAL MISAPPLICATION OF
FACT.

(8.) That some of these abnormal growths, such as cancers and tubercles, “have tended from their commencement” to produce “that state of total indefiniteness to which a dead body is finally reduced” is no proof of their indefiniteness while they and the bodies on which they prey continue to exist without dismemberment. Their definiteness does not depend upon the period of their duration nor on the ultimate result of their operation. The very word, “tended,” by which he seeks to prove his point, proves the contrary, because it is the admission of a definite operation in consequence of which an issue can be definitely predicted.

§ 11. PROCESS AND ITS RESULT EQUALLY DEFINITE.

(9.) The “blurring of the minute structure” in this operation is a definite operation, though its result is the destruction of certain definite forms, the oppo-

site process to evolution, the change from heterogeneity to comparative homogeneity. That this is the *result* of the process is no proof that the process is not itself perfectly definite. Indeed, no change or process is possible or conceivable except as a succession of distinct and definite forms; for the contrary supposition is suicidal. Hence his statement is not strong enough, and it is implicitly untrue that "each step in the destruction of the organic compounds is *accompanied* by a blurring." Every such step is *not accompanied* by, but it *is* and *constitutes* such blurring. The only distinction admissible is between the blurring antecedent and the blurred consequent, which are definitely marked off from each other and from everything else; otherwise our words are without meaning.

§ 12. ANY INCREASE OF HETEROGENEITY THE
CHARACTERISTIC OF EVOLUTION.

We have said that the absolutely indefinite homogeneous is unknowable and inconceivable. Spencer's discussion of ultimate religious and scientific ideas advocates this. Its denial contradicts itself, because the known and conceived and every predication, whether affirmative or negative, is of some property which has or is determinateness. Hence it follows with logical necessity that perfectly indefinite homogeneity, or perfect homogeneity without determinate mark, is unknowable and inconceivable.

Hence also it follows that evolution is not a change from purely indefinite homogeneity to definite heterogeneity. There is no such homogeneity; and if there were, we could never know it; and we have neither cause nor reason for assuming it, while its assumption is further precluded by its self-contradictoriness. *Evolution therefore can only be a change from the less heterogeneous to the more heterogeneous*; and the former will and must have less or fewer distinctive marks than the latter, else it would not be less heterogeneous, for heterogeneous is other kinds of marks or properties or forms, and more heterogeneous means more of such marks, each of which is definite, else it were nothing to us.

There is, however, an ambiguity on this subject which ought to be considered. We often speak of simple substances, because there are substances which in common speech cannot better be described than by such a phrase. But these simple substances so called are simple only in the sense that we cannot analyze and dissolve them into a plurality of substances; that is, they are not compound so far as known. Yet all these have a plurality of qualities contradistinguished from each other. Thus an atom of carbon, which is a simple substance, has peculiar properties which discriminate it from oxygen or other substances; and besides this, it has location, extension and shape, though we may not be able to measure and define them.

These special properties are among the essential

characteristics of all changes in the increase or diminution of heterogeneity of which Mr. Spencer treats. The tree reduced to charcoal differs from the simple atom of charcoal or carbon only in the number and arrangement of its atoms, and it is this arrangement which makes the charcoal tree more heterogeneous than the atom of carbon or than the diamond. Mr. Spencer expatiates extensively on the heterogeneity of form, and all his illustrations of evolution or progress are examples of heterogeneity of form, which is all we know of organic heterogeneity; and yet this heterogeneity is composed entirely of lines and surfaces, so far as we know; and a greater heterogeneity is composed of a greater number of these; and as in some degree these in cubical transverse directions belong to the simplest possible of substances, there is nothing that is absolutely simple and homogeneous and indefinite. While there are simple properties, these properties are not separated and isolated as substances or things, and everything that exists or that can exist is composed of several different properties. Hence, as we have before said, evolution is not a change from the absolutely homogeneous, simple and indefinite to the heterogeneous, but simply from the less to the greater heterogeneity; and both the less and the greater are equally definite, and are or may be equally coherent. The less heterogeneous we may for convenience in common parlance call homogeneous; but in sentences which define a system of philosophy we ought to be more accurate in thought and expression.

We hence see a new light thrown upon Spencer's frequent phrase of "the instability of the homogeneous." In order to conform to fact and truth, it will have to be replaced by the conception and phrase of "the instability of the heterogeneous." All existence and therefore all stability or instability is of the heterogeneous. But as the distinction between the homogeneous and heterogeneous is practically broken down, his phraseology and treatment will have to be greatly modified. It will also have to be considered whether the less heterogeneous is more unstable than the more heterogeneous. We incline to the conviction that on this point there is no definable difference, as we have before indicated.

§ 13. WHAT IS COHERENCY?

We now proceed to consider his second mark of evolution or progress—coherency. We have said that it is a contradiction to apply either this or its correlative to perfect homogeneity; but as we have seen that there is no known or conceivable perfect homogeneity, and as imperfect homogeneity is heterogeneity, it is only in reference to relative heterogeneity that these correlates can be discussed. The heterogeneous may be either coherent or incoherent. Evolution is a change from less to greater coherent heterogeneity; and the less heterogeneous may be called homogeneous where internally it appears to be simple or nearly so, so that it is discriminated

from other things only in its totality and its temporal and spacial relations. What we want to settle now is the meaning of coherent and incoherent, and consequently what is that "kind of change which characterizes evolution" and that which "does not." Coherence is that or of that which coheres, and incoherence is its opposite. Coherent heterogeneity, therefore, is that which integrates or which consists with continued integration, and incoherent heterogeneity or homogeneity is the opposite of this. Hence cancers, tubercles and other differentiations which tend to the disintegration of the bodily organism are said not to be cases of proper evolution or progress. But for the opposite reason it follows that wens, warts and callosities are specimens of progress, for they cohere with the organism without any evident damage to it while augmenting its heterogeneity. Spencer's discussion of integration in this connection shows, we suppose, that this is what he means by coherent heterogeneity, *a definite integrated distinctive organ or organism*. The *coherent is therefore the organically cohesive*. Coherent sometimes means symmetrical, but that does not belong here except as a very subordinate idea and fact that organic cohesion has generally some degree of symmetry. We shall therefore inquire whether progress is always an advance or change from homogeneity to heterogeneity or from less to greater coherent heterogeneity.

§ 14. COHERENCY NOT TO BE CONFOUNDED, AS IT IS
BY SPENCER, WITH SOLIDITY.

Before entering on this inquiry we are compelled to notice that on this point of coherence, as on the point of definiteness before considered, Mr. Spencer employs language, even in his most important sentences, so inaccurately as to offend our judgment and to raise in us a doubt as to what his view is, or even whether he has any that is perfectly clear and self-consistent. Thus he says, as the result of one of his numerous or extensive inductions: "Evolution, then, is in all cases a change from the more diffused or incoherent to the more consolidated or coherent form." (T. P. p. 211.) Here consolidation is identified with coherency, and diffuseness with incoherency. To consolidate is to make solid or dense or close, which is the opposite of diffuse; and so coherency means solidity, density, while incoherency means diffuseness, expansion! This is an extraordinary use of language, which could originate only in mental confusion, and it tends to greater confusion in letters, philosophy, and science. However much coherence and solidity, or incoherence and diffuseness, may go together, they are not the same. Neither do they always rise or fall together, or in the same ratio. There may be great coherence and small solidity or denseness; or there may be great solidity where there is small coherence or

integral and organic or mechanical cohesiveness. A feather is very coherent in the sense of having great organic cohesiveness (as well as symmetry), but its solidity is comparatively small. A jelly-fish, on the other hand, while its organic coherence is very small, the whole organism being easily disintegrated, yet as an organic body it is far more solid than very many organisms which are far more differentiated and far higher in the scale of existence; while the water, the chemical compound in which it floats, is still more solid and still less coherent. Water in crystallizing into ice or snow becomes more diffuse, less consolidated, yet it becomes more coherent, mechanically, chemically, and symmetrically.

From some portions of the connection I infer that Mr. Spencer would probably reply that he is not here speaking of solidity and diffuseness as between different organisms and grades of organisms, but only in relation to the formative material and process and their resultant product as differentiated and integrated members of any organism. I incline to think however, on further reflection, that this supposition is a fabrication of my own for his benefit; for on again looking at his words and their connection I cannot see in them this idea thus limited. He is speaking all along of universal evolution, and expounding its law, and the terms of the sentence we are criticising are absolutely universal. "Evolution then, is *in all cases*," a change of this kind, he says. Nor would such a limitation excuse or justify in the

slightest degree the terminology which we are censuring; for the terminology is the point on which our censure here rests; and though this censure has at the same time seriously damaged his doctrine of progress, it is more than we now intended and could not be avoided.

It is not therefore strictly true, as he afterward says, that "a change from the indefinite to the definite can arise only through a completer consolidation of the parts." (T. P. p. 214-215.) "Completer consolidation of the parts" is sometimes necessary; that is, it is necessary when the integrated parts are more solid than their component parts were before the integration; but in no other case; and it remains to be proved that this is always the case. But it is disproved by the example of the crystallization of water into snow or ice. Ice and snow are harder, and in that sense are more solid; but they are not more solid as the opposite of diffuseness, which is the sense in which he uses the term consolidated. So the evolution of a tree is mostly or wholly a process of crystallization, and the living tree is crystallized carbon and water; and this product, though harder, is less dense or solid than the aqueous solution, sap, whence it is derived, and of which, chemically changed in part, it is composed. The food of animals is often more dense and solid than the organic structure into which it is transmuted; for this food, when mashed and consolidated in the stomach, is devoid of all those structural separations

of parts which belong to all organic life. Whether the integrated organ or organism is harder always than its component elements is an inquiry which we are not now called to make, for that is not the one which Spencer raises.

We have admitted that increased coherent heterogeneity does sometimes arise from or necessitate a "completer consolidation of the parts." But while this is evolution, it is not the law of evolution, not being evolution in all cases; much less is it the law of progress. This evolution beyond a certain point will in some cases be the reverse of progress. The ossifying process may be carried so far as to diminish the power while it stops short of the destruction of the organ; or the skin, instead of being left a delicate and beautiful covering for the sensitive nerve, may be so far consolidated that the nerve ceases to be a source of pleasure or of information; or the delicate frontal membranes of the eye may be so greatly consolidated as to exclude the light. These processes to these extents would be processes of evolution; but no one would consider their result to be specimens of progress, which we should have to do on Spencer's doctrine. Such a process and result of consolidation are examples of evolution, but they do not show the full law of evolution; and they show neither law nor example of progress.

CHAPTER XVI.

PROGRESS IS CHARACTERISTICALLY TELIC.

§ 1. CONFUSION OF CONCOMITANT AND
CHARACTERISTIC.

WHILE Harvey, Goethe, and Von Bauer were right in their statement that development from the seed and ovum into the plant and animal is a progress from the simple to the complex; yet while there is a progress in connection with these changes, it does not follow that the progress in these cases *consists* in these changes from the simple to the complex, much less that such kind of change is always the characteristic of progress. These changes may be only concomitants of progress; or if they constitute in these cases the elemental changes of progress, this may possibly be only a coincidence and accidental, not a universal necessity and characteristic. We cannot therefore deduce the definition of progress from any number of changes merely because in some cases progress is admitted to be connected with them, much less can we thence identify these changes with the notion of progress. If we attempt this we shall be found guilty of making an unjustifiable inference and generalization and of confound-

ing a concomitant with a characteristic, or of assuming that a phenomenon is the latter because it is the former. It is here that Spencer has erred, and the error is fundamental and fatal.

§ 2. SPENCER'S NOTION OF PROGRESS INADEQUATE.

No changes in degree of complexity or heterogeneity, however coherent and definite, necessarily contain the notion of progress, though this notion may often include them. They are all inadequate. They do not necessarily include the ideas of value, worth, use, beauty, pleasure, honor, right, all of which are in some way always involved in the notion of progress. For the notion of progress has always a subjective reference, a reference to our honor or happiness and advantage, or our intellectual satisfaction in some way. Though this progress may be attained by increasing complexity, it is not in any case the increasing complexity which constitutes the notion of progress, but only the conditions or causes of its realization as an experience.

§ 3. PROGRESS POSSIBLE WITHOUT ANY AUGMENTED COMPLEXITY.

There may be increased coherent heterogeneity from the indefinite to the definite without any corresponding progress. I say *there may be*, because it is not necessary that all the examples adduced be real

cases. For the purpose of illustration hypothetical cases are as good as real examples; and while the latter may be furnished in abundance, the argument does not require confinement to them. A perfect definition will cover everything, real or imaginary, that legitimately comes within the meaning of the terms.

According to this definition relative superiority between things compared, or between different stages of the same thing, is always to be determined solely by the greater degree of definite and coherent heterogeneity. Such a test, fairly stated, is its own refutation. It will be rejected at sight. According to this definition those trees which begin their branches at the foot of the trunk and continue them to the top are more advanced in all cases than those which do not; so that the elm and oak would be better if they did the same, and are inferior to the spruces and pines, and all wood that is nearly filled with knots of various forms and sizes is better than wood with few or no knots in it. On this principle the relative superiority between a diamond and a piece of charcoal will be difficult to determine. They are both simple and the same substance, and the charcoal is perhaps in form the more heterogeneous of the two.

If animals along with their matured members should retain also their embryonic members, they would be so much more heterogeneous; but wherever there is any sign of such retention of embryonic members it is considered a sign of imperfection, not

of progress. Since man is supposed to be evolved from inferior orders of animals, it is legitimate to suppose that along with those members which we have acquired or improved we might have retained others, as a tail, a pair of branching horns, a water-sack like that of the camel, a proboscis like that of an elephant, and a ruminant apparatus, with numerous and various wens, warts, and moles, and other permanent organic excrescences. This would be a vast advance in definite and organically coherent heterogeneity. That this is all imaginary is no argument against it; for it is a possible case; and if its actual existence in man would not be an improvement, or an element of progress to his organization, the definition is wrong. Perhaps all these differentiations do not belong to one line of progress by natural selection; but that does not alter their value as elements of a possible progress, so that man would be better organized if he had them all—if this definition is right.

Spencer is fond of sociology, and the differentiations of society are among the proofs of his principle. They shall be among our refutations of it. Here increasing heterogeneity from the less to the more definite, though often beneficial, has been generally an advance toward evil and in evil. Caste is one of the civic and religious differentiations of India; and something like it is also the effect of civic evolution in Europe, where the population is or has been divided into princes, nobles, commons, peasants, serfs, and slaves; and over all we have sometimes

seen the priestly caste, which has been most strikingly differentiated in the darker ages. The United States is in the rear in these elements of progress; and, strange to say, it has fought hard and suffered much to be rid of them. There was the definite heterogeneity of slavery, which with fearful effort the nation destroyed; and it is still trying to increase the homogeneity between the North and South as one of the steps and conditions of further progress.

A growing homogeneity between different nations and between different sections of the same nation has always been recognized as an element and proof of progress, where this change has been the effect of freedom and not of repressive force. The welding and fusion of all the old Gallic tribes and Norse settlers into a comparatively homogeneous mass has made the nation of modern France. A similar process has successively created England and Great Britain. It has given us the Prusso-German empire for the old federal empire of Germany. It has given us the kingdom of Italy for the many petty states that divided the Latin boot between them. It has given us the United States for the old colonies. Never was the world so homogeneous as it is to-day; and heterogeneity itself is made to promote this result by a counter law, as by diversified and multiplied inventions, the most distant nations can understand and appreciate and coöperate with each other. Hence even languages and dialects are

diminishing in number and a few leading languages are supplanting the weaker and inferior. Tribes and races that will not conform to this law of growing homogeneity have to perish.

The division of labor attained in modern times is both cause and effect of progress and one of its social elements generally, and on the whole it is of great benefit. But it is not a benefit in all cases; and if there is an exception, it is fatal to the definition in question. It is very obvious that the division of labor may be carried to excess and may be misapplied so as to prevent progress and be very repressive to all good energy. If the priest or ecclesiastic should undertake to do all the religion for the laymen, if the common people who do all the work should do none of the thinking, if separate classes were allotted to do all the thinking for the state, for science and philosophy, for the arts, for the army, for the navy, for agriculture, for manufactures; and still more, if each of these classes were minutely subdivided and definitely fixed; if, further, all education should be purely technical and strictly confined to the line in which the subjects are to operate, so that they should not hear a public speech or lecture in common or transgress their respective lines in family or private reading or conversation; if, still further, all productive avocations, from the merchant and manufacturer down to the day-laborer, were to be confined to selected families and descend from parent to children, and their styles of dress to be always

different and distinguishable, though changeable in some points; and if, finally, every avocation were to have a peculiar style or cut of the hair and beard—all this would be equally heterogeneous and unhappy. All these differentiations have been more or less attained or attempted by society in what we now consider less enlightened ages. Modern progress is here largely the effect of greater homogeneity. We have found that heterogeneity may be bad by excess, which were impossible if that were one of the essential characteristics of progress, just as impossible as it is for the good to become bad by becoming better.

It would be a still further advance in heterogeneity if certain families were allotted and determined to wear the poorest garments, sometimes too scant for the cold, to eat the coarsest food and often insufficient, and to live in miserable hovels; while others were always to feed only on luxuries, to dwell only in palaces, and to dress in purple and fine linen—a differentiation which has too much resemblance to fact in many parts of the world. To admit that increase in this kind of differentiation is the essential element of progress would be destructive of all moral principle and all benevolent impulses.

In the family it is also found that heterogeneity may exist in a very injurious degree. In the old times a man was the autocrat of the house, and his wife or wives and children were slaves. That is the barbaric differentiation, which still lingers and struggles for perpetuity. Happily, there is here a great

and growing advance in homogeneity. There is a growing recognition of mutual rights and dependence and advantages, and of the blessings of mutual conformity, and of the cultivation of common tastes, pleasures, pursuits, and interests. If there is more differentiation in the individuals, there is less in the family as such.

In the province of science and philosophy, progress is always by simplification. It implies a growing knowledge of particulars; but this is not philosophy nor science. Science is the recognition of the general principles or forces which comprehend all known particulars, so that the progress of science is always from the heterogeneous to the homogeneous through particulars.

Scars from wounds coherently differentiate definitely without progress, and there are wounds and scars of the mind. We may also differentiate the mind, especially in early life, by exciting bad passions, principles, purposes, or by exciting good ones. The latter effect would be universally called progress, while the former would be called anything else. Society also would be as much differentiated by sowing false and vicious principles as by sowing true and virtuous principles. But no one, however staunch as an evolutionist, would call them both by the same word of progress. This word in this connection would be confined to the just and virtuous differentiation, and in view of the proper end to be sought and attained.

The progress of religion observes the same law. In barbarous ages everything is mysterious, and everything mysterious is a god. From polytheism to monotheism is therefore a vast advance. Then there is another advance in simplicity from the Jewish Jehovah, who to the average Jew was only a mightier Jew, to the God of Christianity, in whom ethnic differentiations are lost. From the latter Deity, when conceived anthropomorphically, to the Inscrutable, the Unthinkable, the Absolute Unknown, of Sir William Hamilton and Herbert Spencer, there is another vast advance from the complex to the simple.

In spite of all our glosses, advance or growth in anything considered good will be accounted progress though there is no new differentiation. There may be increased bodily vigor without increased bodily complexity; and mental force may grow larger without any new *kinds* of force or increased versatility, and perhaps at the expense of versatility, as Newton's addition to science impaired his capacity for society. The mind may be injured and an army destroyed by differentiation.

I think it also more than doubtful whether this definition of progress will be supported by comparative anatomy. Spencer has only just touched on this point, and it does not belong to my line of study. But there are some things here that are obvious to common students. The camel, the cow, the sheep and goat, and other ruminants, are inferior to the

horse; but their cloven feet, their ruminant apparatus, their horns, and the humps and water-sacks of the camel and more developed teats in the cow than in the mare, prove them to be more heterogeneous than the horse. The rhinoceros and the horse may be compared to the same effect. Apes without tails or cheek-pouch are considered superior to monkeys that have both. In many respects man is less heterogeneous than the brute races. Some of them have longer ears, some have scales or a heavier hide, or feathers or abundant and more various hair, besides horns and tail; and the bones of some have more flexures in them and are less in a line with each other, and some are amphibious, while still others are adapted to land and water and air, as the web-footed fowl. Spencer observes that civilized man is more heterogeneous than the savage, his thighs and legs being larger and stronger relative to his arms. But the heterogeneity is equally great if the arms are large and strong relative to the legs, which is strikingly the case with many of the ape and monkey races, their arms often reaching to the ground when they are standing erect, and those arms are as lithe and strong as they are long. The limbs of a civilized man, it is said, are better developed, compared with the trunk, and especially compared with the abdominal part, than they are in the uncivilized. This is true sometimes, not always. Compare the North American Indian with the average Englishman. Besides, this kind of development is conspicu-

ous in the long-tailed monkeys, whose abdominal development is exceedingly meagre, while the development of arm and tail and leg is marvellous. According to this criterion, monkey is far in advance of man. Admit that man has a somewhat more complex nervous system than brutes, yet he appears on the whole decidedly behind some of them in heterogeneity. Viewed from one stand-point it is also quite apparent that the Negro's head is more heterogeneous than that of the ideal Caucasian. Witness his wide nostrils, thick lips, large teeth, capacious mouth, projecting muzzle and chin, receding forehead and disproportionately distributed brain. Some of the features of the infant face enumerated by Spencer are against him, as "the divergence of the nostrils, the form of the lips, the width between the eyes," to which we may add the open sutures of the head. Ossification in youth is generally progress, in the aged it is always decay

§ 4. PROGRESS DEFINED.

If Spencer's definition of progress, as identical with evolution, cannot be admitted, we must either reject both his doctrine of evolution and of progress, or we must accept his law of evolution and form another definition of progress. We choose the latter. But in this case the change from the less to greater heterogeneity, which is Spencer's evolution stripped of its misleading verbiage, is not only not

always progress, but it is not therefore always the highest form of operation of force known to us. There is such a law of change as he imperfectly describes, and denominates as progress and as evolution, and which he illustrates with endless detail and reiteration of examples; but this is not the only law of force, nor is it the highest law. There is, as we have seen, the constant and universal operation of the law of involution, which is the converse of evolution; and the former is as much entitled to respect as the latter. As they are both constant and universal, they act only as they interact and counteract, and neither can operate without the other, and they may be considered as the resultant counter aspects and forms of the same force of nature. All relatively fixed forms and forces are the equilibrated result, as we have said, of their interaction and counteraction. And these two laws are subservient to still *higher* laws—I do not say broader or more extensive.

We define progress to be any result or process by which sensibility and intellect (using these words comprehensively) may be more gratified, and be advanced in capacity and power. Progress is always telic, and the end is always sensitive, for even the intellect is sensitive, or has sensibility; and the word progress is without meaning except in reference to consciousness and its gratification in some form; and in all evolution prior to and *irrespective* of sentient and conscious existence there is no progress. It is

intelligence alone that conceives progress, and progress must therefore be conceived in accordance with the highest law of intelligence.

§ 5. THE NOTION OF PROGRESS ESSENTIALLY TELIC.

Mr. Spencer wishes to separate the idea of progress from all ideas of advantage and happiness and teleology. But this is impossible and unphilosophical. As sentient beings we must account increased happiness and conditions favorable to it to be progress, and these will be the standards by which progress will be measured in spite of all our definitions. As intellectual beings who form and strive after plans, progress must be approximation or supposed approximation to the plan or intellectual end. As moral beings, and therefore as under *obligation in regard to ends*, we must estimate all things in reference to moral ends. All progress therefore must be conceived as teleological, with its end either in sensibility or intelligence or conscience, or in any two, or in all three of them. Unconscious nature herself seems to recognize a natural teleology, and to move toward definite ends. It is only as we conceive and construe her motions as tending toward an approved end that we designate them as motions of progress. It is partly on this principle that Darwin has constructed his argument on the origin of species and the descent of man. In one of his lectures Prof. Tyndall observes, that "the eye is to be judged by

what it has to do." If we ask Mr. Spencer why or how he determines that increased heterogeneity from the indefinite to the definite is progress, he can give no answer except a subsumed teleological one.

§ 6. GRADES OF TELIC NOTIONS

Teleology is not only essential to the notion of progress, but there are different orders of ends, as the sensitive, the intellectual and moral; and the last is superior to the other as the second is superior to the first. Conscience is supreme, and claims absolute homage. Thus all ends are subordinate to moral ends; and all progress must be in harmony with moral sanctions. But in moral deliberations relative heterogeneity is never thought of as a determining principle. It is entirely foreign to the subject; and the decision is as likely to favor simplicity as complexity. Varied gifts may be condemned, while mediocrity or inferiority is approved. Here Howard is above Marlborough, and Washington above Bonaparte. Here, not growing mental versatility, but growing devotion to moral ends, is progress.

§ 7. PROGRESS AND ADVANCING SUBJECTIVE SIMPLICITY.

An excess of mental heterogeneity makes many people comparatively miserable all their lives. They

therefore naturally seek homogeneity as the more desirable state. Bad men seek a bad homogeneity by subjugating and conforming all the nobler to the inferior elements of their character. By this process they often gain a marvellous power for evil, and of self-complacency in evil. This may be called progress in evil. But it is not progress simple and absolute. But the growing homogeneity may be toward the morally good. This is progress simple and absolute because it is advancement toward the highest end of being.

§ 8. PROGRESS NOT NUMERICAL OR QUANTITATIVE
ESSENTIALLY, BUT QUALITATIVE.

All true progress is qualitative. It is an approximation or increase of that which is deemed intrinsically good. Consciousness is not a variation or differentiation of unconsciousness, but a different and higher quality; and its production, and all conditional causes of it and all increase of it, are elements of progress. As all force is quality, and as there are many forces, their variations are not all purely quantitative and numerical, but also qualitative. The change is qualitative from the seed to the tree and from the egg to the animal. Progress is always from the inferior to the superior quality, or from the less to the greater degree of the same quality; and these sometimes coincide, and sometimes they do not coincide, with increased heterogeneity.

In the production of the tree and animal from the seed and egg they coincide. In the moral renovation of a bad character, and in simple increase of any quality, they do not. But in both the latter cases the progress is teleological, as its measure and standard is some contemplated end or good in view, of sensibility or intelligence or conscience.

§ 9. THE ANSWER TO THE QUESTION "WHY" IS ALWAYS TELIC, AND SO HIS ARGUMENT IS BASED ON A TELIC ASSUMPTION.

We have said that if Spencer were asked why he considers coherent differentiation and integration to be the essential element of progress, he could give no answer except a teleological one. We now return to this idea, and we distinctly put the question: How does he know or on what ground does he conclude that those innumerable cases of increasing coherent heterogeneity which he adduces or refers to are examples of progress? We allow that they are, as he alleges, examples of increasing coherent heterogeneity, of continuous differentiation and integration; this is not to be disputed, and it never has been and never could be, and it needed no argument to prove it. The question here is not what are the modes in which nature's forces are evolved into their ultimate forms, nor what are these ultimate forms. The real question is: What are those forms and processes, whether evolution or involution or the equilibration

of the two, which are entitled to be called progress? If it is assumed that all changes are entitled to be called progress because they are a process from comparative homogeneity to coherent heterogeneity, we challenge the assumption. If the assumption is abandoned and proof offered, we inquire into the proof. This proof Spencer is supposed to have furnished in abundance, and this is what he supposes himself. But this is an error. He has assumed at the outset the point of debate, and then with vast and learned labor he illustrates his assumption. For if progress is something else than this; that is, if it is not assumed to be this, his illustrations do not illustrate or exemplify it; but as he always assumes that they do illustrate by exemplifying it, it is clear that he assumes the point in debate. On the other hand, if it is questioned or doubted whether Spencer can have been guilty of so flagrant a *petitio principii*—for his genius and fame will make it hard to believe—we will show his illogical process by another route. It cannot be denied that he enters on the discussion with some notion of progress, a notion prior to and irrespective of his theory of evolution, a notion with which it is supposed his readers will agree, else he could not compare evolution and progress and pronounce the latter to be identical with the former, which is his avowed process all through the discussion; and all his illustrations are cases of evolution from comparative homogeneity to coherent heterogeneity, and are adduced as being therefore examples

of progress; and he appeals to his readers to say whether such cases of evolution do not meet and exemplify our idea of progress—to which appeal we reply in the negative, with emphasis. Now, if he assumes at the outset, positively and definitively, that they do, he begs the question. If he assumes this provisionally, he only finds cases that meet a provisional definition of progress; but if he concludes, because he finds cases which meet a definition which he has made for the cases, and which has been avowedly suggested by the cases, that therefore the definition is correct and precludes all others, he none the less begs the question. For the point in debate is whether that definition is correct, not whether there are any facts which correspond with the definition. We allow the facts, and that they fit that definition, while we deny that they are therefore always and necessarily exemplifications of progress.

If it is argued that he starts with only an undefined notion of progress, and seeks by interrogating nature to ascertain its precise character, we inquire how far is it undefined? If it is absolutely indefinite, it is no notion at all. It must therefore have some definite property as a characteristic. As he has said nothing on this point we must find out this degree of definiteness. Reflection and analysis will reveal that (1) the notion is assumed to have an independent origin in the mind, that is, an origin irrespective of evolution, else evolution could not be compared with it, and adduced as conforming to it.

(2.) It is also assumed to be a superior conception to that of evolution, else it could not judge and justify evolution as conforming to its requirements. Spencer's whole argument, therefore, in endeavoring to prove that the only and essential conception of progress is evolution, stultifies itself. The conclusion knocks away its own foundation. The argument begins with saying, virtually, that we have some idea of progress, independently and irrespective of evolution, and that we propose to compare evolution with this idea, as the standard and judge, while the conclusion affirms that we have no idea of progress except as evolution, that evolution is the type and standard of all progress.

It may be supposed that Spencer concludes only that evolution defines what otherwise was indefinite, and so he does not in the conclusion destroy his basal assumption, but simply gives it a clear and fixed delineation. This is certainly what he aims to do, and whether his method is conclusive for this end is what we are investigating. It would be conclusive if he could once prove that evolution and progress are one. It would then logically follow that, however vague our notion of progress before, it has now become just as precise as is this law of evolution. But the fact that there is such a law as this of evolution is no proof that it is identical with progress, any more than the existence of other laws is a proof that they also are identical with progress. He can convert the two only by assuming the point in

debate thus: Progress is evolution, evolution is always by continuous differentiation and integration; therefore so is progress. Or thus: Evolution is in some known cases progress; these cases may be considered as representing all cases; therefore evolution is always progress. The first premise in the first of these syllogisms is an assumption of the point in debate. In the second syllogism the debated point is assumed in the second premise. We admit that some cases of evolution are cases of progress; but we do not admit that these represent all cases, and we hold that we know many cases of evolution which are not cases of progress, and many cases of progress which are not cases of evolution, according to his definition of evolution. What Spencer does prove is, that there is a law of evolution from the less to the greater heterogeneity. He has exemplified this by such a wide and multifarious and diversified induction that he is entitled to infer that it is a universal law. There is an inference subordinate to this which his induction has also made proximately justifiable. That, as this process of evolution is very often indisputably coincident with what all admit to be progress, we may with a degree of probability infer the latter from the former when we have no other data; that is, if there is any case where we have no other data. This is all the bearing that Spencer's law of evolution has upon the determination of progress in any case.

Mr. Spencer generally begins his illustrations

of the different elements of evolution as progress with the nebulæ, and he thence ranges through all changes to the indefinitely diversified phenomena of modern life. If we were to take the same range we could produce an equally extensive and various induction of examples of evolution that are no progress according to our view of its nature, and of facts and processes which no one could question as examples of real progress, but which are not examples of evolution as a change from the less stable to the more fixed and coherent heterogeneity. On his theory we have instances of progress in the nebular masses, in their unequal cooling, crackling, ring-forming, ring-breaking and ring-trajecting processes. Now we ask why are these adduced or adducible as examples of progress? Why should we not be equally justified in denominating the reverse process, the falling of the planets into the sun and their fusion together, by the term progress? To these questions there is no answer, except that the former class of processes is, and the latter is not, a direct advance in the successive changes which are ultimately to result in sentient and intelligent existence; that is, that it is not because of the increase of coherent heterogeneity simply, but because of the teleological conception which we impose upon them.

Now then let us suppose all life were extinct in our solar system, that molecular motion or heat were nearly all transmuted into molar motion and all was dark and cold and still, except the motion of the

orbs on their axes and in their orbits. This state must be eternal unless these orbs are brought into collision and fusion with each other. This collision and interfusion on the theory of evolution would be necessary to the re-introduction of life and conscious intelligence. In this case any mind (like ours at least) contemplating the scene from afar in some planet of another system, would account this collision and fusion of our system to be an example of progress as a necessary change in the direction of a higher state and the development of a higher class of forces or a higher class of ends. Progress is nothing except to intelligence, and to intelligence it is always simply an advancing change toward higher and ever higher ends till its highest desires and conceptions are realized.

Thus from beginning to end the teleological conception governs all our judgments and estimates of progress. We do not indeed ascribe design to nature; but as we have ourselves designs and ends (which centre in ourselves to a large extent, if not wholly), we value and judge of all things in reference to conceivable ends, real or possible, practical or theoretical. We could illustrate this principle as extensively as Spencer has illustrated the law of evolution, and the process would be philosophically self-consistent, while Spencer's is not, as we have seen; for we should be illustrating and exemplifying, what all admit, some notion of progress as a series of changes advancing toward some conceived end; while he

gives examples of evolution as proof that this, and this only, constitutes our notion of progress; which examples of evolution have no bearing on this point at all.

Our notion, and the justness of our notion of progress is to be determined only by an appeal to consciousness where alone and for which only it exists. An infinite number of changes from less to greater coherent heterogeneity could prove nothing. It would still remain for the conscious mind to say whether all these changes, and these only, are examples of progress, and whether the proper definition of progress and Spencer's definition of evolution are one. We take a different view of the subject, affirming that the essential conception of progress is advancement, whether by his evolution or otherwise, toward a conceived and desired or esteemed end; and without further example we appeal to the considerate judgment of the thinking world for justification, and without fear of being condemned.

§ 10. EVOLUTION AND INVOLUTION THE WIDEST OF
ALL LAWS.

The laws of evolution and of involution are the widest of all possible laws, because they cover all possible change of phenomena, both in matter and mind and in all worlds. All changes must be one or the other, either from comparative homogeneity to comparative heterogeneity, or the contrary. Some

changes may at first thought appear to be neither one nor the other, as being only changes of relations. But a change of relations is a change from one combination to another, and one combination gains while the other loses; that is, one is increased and the other is diminished in heterogeneity. Thus these laws are demonstrably universal. We need no elaborate and extensive induction to prove this, but only to illustrate and impress it. The law of gravitation, the widest known law of matter, is confined to matter, and this in point of breadth or extensiveness yields to evolution and involution. In the kingdom of matter, however, they are commensurate, and the force of gravitation seems to originate the forces and laws of evolution and involution, and the latter would be nil without gravitation.

§ 11. THE WIDEST LAWS ARE THE LOWEST IN
DIGNITY.

These laws, being the widest of all known laws, are the lowest of all. There seems to be a general supposition, shared apparently by Spencer, that the breadth and dignity of a law are always commensurate, if not identical. We are in the habit of speaking of carrying up a notion to its highest generalization or to the utmost generality of form; and in this way perhaps has arisen the supposition in question. Yet we are all familiar with the logical rule that the higher the generalization the less the comprehension;

and a little reflection will show that the less the comprehension the less the quality of the total conception. The conception of a proximately perfect individual horse, for instance, contains much more than the general notion of horse, which contains only what is necessary to the notion of any horse however poor. This truth holds respecting the relative width of nature's laws, or laws of natural, social, and moral forces. The wider they are, the less pregnant and significant; and the narrower law always contains much more than what distinctively belongs to the wider law. The commercial law of demand and supply is limited to commerce, and it therefore implies men and various forms of social life and intercourse, which do not necessarily and distinctively belong to evolution or involution. This commercial law, like all others, is always an example of evolution and involution, and always contains them, while they do not contain it or imply it. They extend to this, this comprehends them. So evolution and involution extend to all the more limited laws, while these in turn comprehend them and much more than necessarily belongs to them.

§ 12. .PROGRESS IN REFERENCE TO THE EARTH AND ITS FLORA AND FAUNA.

The law of progress is one of these more limited laws. It begins its existence only with mind. It is teleological in its nature, and confined to the con-

ception and pursuit of ends; and while it always contains and exemplifies evolution and involution, neither of them (nor both of them) necessarily exemplifies or ever contains progress. If nature is unconscious and unintelligent till the evolution of man, and if there is no Mind who has made and who controls nature with a view to certain ends, then there is strictly no progress anywhere except in the works of men; and whatever else is called progress is so called only by way of analogy and accommodation. That is, certain changes in nature are called progress, because we see them tending to certain results, perhaps desirable results, as regularly as if they were under the control of mind aiming at an end.

In this sense there is an evident progress toward plant life in the pre-floral history of the earth, not merely because of increasing coherent heterogeneity or by continuous differentiations and integrations, though these were necessary. Yet these were not enough. Disintegration, sediment, and mould, or a process of involution, were necessary. And it is the growing *adaptation* to the resultant plant life which we pronounce progress, whether we observe the growing heterogeneity or not.

There is also a progress in plant life, as well as toward it. In the history of each plant its main progress is well characterized by Spencer's evolution. Yet his definition does not, as we have seen, constitute a universal definition of progress for the entire

floral kingdom. It would, we think, reverse the rank of some of the best known species, though the writer makes no pretensions to botanical knowledge, and submits this with diffidence, and with deference to botanists.

§ 13. CLIMATIC HETEROGENEITY AND THE NOTION OF PROGRESS.

Then there is a progress of the world's evolution toward fitness for animal life and finally for man. On this point it is observable that there is now a coherent heterogeneity in the climatic conditions of the northern hemisphere far greater than obtained in the miocene and pliocene ages, and that yet in point of fact those were better for animal life than this post-glacial age. It is also obvious that there is now the most abundant and vigorous life both of plants and animals where there is least climatic heterogeneity. Compare on this point the tropics with the polar regions. It is evident that while progress is adaptation to higher ends, this adaptation is not determined here by heterogeneity, but sometimes against it.

§ 14. INVOLUTION AS A CONDITION OF PROGRESS.

In the progress of life in all animals, while evolution is constant and necessary, yet involution as a constant process is strikingly conspicuous—a con-

stant and active tearing away and disintegration of living tissue, as one of the essential processes without which animal heat and force and life were impossible. By this dissolution heat is engendered, and consequently force; and if this dissolving process becomes weak, and fatty tissue is accumulated beyond a certain degree, force is diminished; and thus the evolution by which fat is differentiated and integrated, increasing the coherent heterogeneity of the organism, is the reverse of progress, while an advance toward homogeneity by the dissolution of the superfluous fat would be a benefit, and would be universally considered as an example of progress.

§ 15. SIMPLICITY AS A CONDITION OF BEAUTY.

Progress in regard to beauty is very clearly not always an increase of coherent heterogeneity. On this subject Spencer says nothing. We will not dilate. We cannot here tell what beauty is, but only what it is not. It is obvious that there is a beauty of outward forms for the eye and touch which would be spoiled by an excess of heterogeneity however definite and organically coherent, that is, as integral parts. In other words, there may be too much heterogeneity differentiated and integrated into a work of art. The pathetic and sublime especially demand simplicity. And any perfect work of art would be injured by any additional heterogeneity, however integrated. It was no triumph of art to

paint Moses with horns to represent the glory of his countenance. It was not the highest style of public speech to multiply divisions without end, as was once the fashion in some quarters. It was not the highest style of horticulture to cut and clip trees in shapes of birds and other objects, as was the rage at one period. The Gothic style of architecture has far more definite and coherent heterogeneity than the Greek; but *that* simply and solely has never been considered *the* proof of its superiority.

§ 16. SUMMARY AND CONCLUSION.

We shall now conclude our exposition and defence of evolution. Many more things might have been said in its favor, and many more opposing notions might have been refuted; but what has been done must suffice, since what is omitted is not necessary, or is logically implied, and what is furnished contains a refutation of whatever can be further adduced in opposition to evolution.

Our essential argument is very brief—that matter and all nature is a force, that specific forces are known only by their effects, that causes and effects in their specific relation are determined only by the constancy of their connection, that so far as known there is an undeviating constancy in the operations of nature, that we have no right to assume that it was not always so, that therefore so far as we know all that is or has been in the external universe is the

working of natural forces, the uniform precedent being the cause of the uniform subsequent. Hence on this basis we have no need of the hypothesis of a Supernatural Power originating and operating nature. Now let us connect and identify the external with the internal, the material with the mental, as we have done, and the doctrine of evolution as a thorough-going system of naturalism is the only theory that meets the demands of science and philosophy.

Mr. Buckle has well and truly said that, "since every addition to our knowledge affords fresh proof of the regularity with which all the changes of nature are conducted, we are bound to believe that the same regularity existed long before our little planet assumed its present form, and long before man trod the surface of the earth. We have the most abundant evidence that the movements incessantly occurring in the material world have a character of uniformity; and this uniformity is so clearly marked, that in astronomy, the most perfect of all the sciences, we are able to predict events many years before they actually happen; nor can any one doubt, that if on other subjects our science were equally advanced, our predictions would be equally accurate. It is therefore clear that the burden of proof lies, not on those who assert the eternal regularity of nature, but rather on those who deny it, and who set up an imaginary period to which they assign an imaginary catastrophe, during which they say new laws

were introduced and a new order was established. Such gratuitous assumptions, even if they eventually turn out to be true, are in the present state of knowledge unwarrantable, and ought to be rejected as the last remains of those theological prejudices by which the march of every science has in its turn been hindered."

If in this passage Buckle had put forces in the place of laws, or if he had distinctly conceived the laws as simply an exemplification of the forces uniformly operating, he would have had the perfect data for the doctrine of the evolution of the physical cosmos.

Yet we by no means consider the doctrine of evolution, even in the most advanced philosophical state in which it has been presented, to be an all-comprehending philosophical ultimatum. We hold that it is just in its conclusions from its premises, and that its premises are indisputable. But there are broader and profounder truths yet undeveloped, which are partially and falsely discerned, and ignored or rejected; truths which, when fully expounded in their legitimate connections, will show that evolution, instead of being the ultimate philosophy of the universe as it now appears, is infinitely subordinate; and these truths will introduce and demonstrate an infinitely sublimer theory, which will comprise evolution as a vast temple comprises each of its most miniature figures, or as the material universe comprises each of its countless atoms.

The theory of evolution contains a body of facts, of deductions, of inductions, and of generalizations so irrefragably true that, though they may be subsequently covered by further discoveries of facts and by deductions and inferences and broader generalizations, they cannot be overthrown; or, in other words, they may be absorbed, but cannot be refuted. We propose to cover and absorb them. To make the opponents of evolution willing to study the process of this absorption is the mission of the foregoing discussion. The dogmatist must be made to doubt his dogmas before he can be made to see the truth and value of any higher theory or doctrine than that which he holds. We have destroyed his metaphysical fétish that he may be disposed to look up to the true and living God to whom we would philosophically point him. For our pains in pulling down the Dagon temple in which a false metaphysical theology has sought refuge and found first a shrine and then a tomb, doubtless many will kindly wish that we may perish in the ruins we have wrought, or that at least our eyes had been put out before we executed our audacious project, which is just the opposite of our wish and our hope respecting all for whom we write. Yet if they comprehended the spirit and intent of the author, or if they will have patience till he has had time to deliver himself fully, their wrath may yield to milder and kinder feelings; they may find what is intimated in the dedication, that there is truth in all opposing philosophies, which the author

hopes to eliminate from its associated errors and combine into unity, not by a loose eclecticism (which is no philosophy), but by going beneath all theories to their common root, and thus to principles which will disclose in clear discrimination whatever of truth or error any of them contains, and perhaps unfold some things which are true, though not embraced in any previous philosophy.

The absolute unity of the known universe is no longer to be questioned, and as now conceived it precludes a personal Deity and our personal immortality. Now the great problem is: Can we expound this unity so as to prove a personal Deity and our personal immortality? With emphasis I answer,—
YES.

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